EXHIBIT 11

DECOMMISSIONING PLAN

ARROWHEAD SPRINGS
SAN BERNARDINO, CALIFORNIA

BlueTriton Brands
Ontario, California

October 2024

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1. GENERAL

1.1 DOCUMENT DESCRIPTION

This Decommissioning Plan was prepared to outline BlueTriton Brands' (BTB) process for decommissioning the Arrowhead Springs water collection system (System) located in San Bernardino County, California. Decommissioning of the System includes removal of all spring complex infrastructure including vaults, boreholes, and water conveyance pipeline. A description of the System is provided below.

1.2 PROJECT LOCATION

The System is located in Strawberry Canyon which is on the southern slope of the San Bernardino Mountains at the northern edge of the Santa Ana River Basin. The site is located approximately 8.75 miles north-northeast of the City of San Bernardino in Sections 30 and 31 of Township 2 North, Range 3 West, of the San Bernardino Baseline and Meridian. Strawberry Canyon is located within the boundaries of the San Bernardino National Forest (SBNF), in San Bernardino County, California. Figure 1 shows a regional view of the Santa Ana River basin and the subject study area.

The Arrowhead Spring sites range in elevation from about 4,100 feet above mean sea level (amsl) at the lowermost spring, to about 5,300 feet amsl at the higher springs. The uppermost Arrowhead Spring sites are located between 800 and 900 feet below Strawberry Peak, which rises to an elevation of 6,153 feet amsl.

The towns of Rimforest and Twin Peaks are located near the top of the Strawberry Creek watershed, and Highway 18 crosses the upper portion of the Strawberry Creek watershed. The rugged terrain surrounding Strawberry Canyon limits the potential for most land uses and recreational uses by the public within the recharge area.

Apart from the subject water collection infrastructure, Strawberry Canyon is undeveloped. No formal trails or roads exist within Strawberry Canyon, and the Canyon is so thickly vegetated with scrub and chaparral that temporary trails quickly become overgrown. The only trails that currently exist within the Canyon are those created for the studies described in this Report. Although Strawberry Canyon is relatively close to urban areas, the extreme ruggedness and dense vegetation render Strawberry Canyon nearly impassible on foot where trails have not been cut. The Canyon walls are composed of steep rugged slopes, commonly with grades of 50 percent or more. Individual slopes near the Spring sites range up to 65 percent grade, with near vertical granitic outcrops in some locations.

1.3 SYSTEM DESCRIPTION

Water collection infrastructure includes 10 horizontal boreholes and two water collection tunnels constructed at spring locations at five separate sites within Strawberry Canyon. Water collection infrastructure, including vaults and pipeline easement, occupies an area of approximately 4.5 acres within the 4.4-square mile watershed. The existing water collection system (initially constructed in the 1890s) in Strawberry Canyon was supplemented in 1930, when Tunnels 2, 3,

and an infiltration gallery at Spring 7 were constructed to collect water. Beginning in approximately 1950, 10 horizontal boreholes were constructed to collect water, and the Spring 7 infiltration gallery was decommissioned.

The horizontal boreholes at each complex were developed for the purpose of producing water from the fractured bedrock aquifer. Percolating groundwater flows by the force of gravity through bedrock fractures into the borehole screens and into the water conveyance pipeline, without the assistance of pumps. Each of the boreholes consists of a horizontal boring drilled into fractured bedrock, with a cement surface seal and perforated borehole liner. Each borehole was constructed for the purpose of intercepting percolating groundwater that is hydrologically connected to the adjacent spring locations. Water collected from the horizontal boreholes and tunnels is conveyed by gravity through over 15,000 feet of an aboveground 4-inch pipeline to water silos at the San Manuel Band of Mission Indians (SMBMI) Arrowhead Springs Campus (SMBMI Campus) outside the boundaries of the SBNF.

The horizontal boreholes and tunnels are described below.

1.3.1 Water Collection Infrastructure

The water collection infrastructure is located in three general areas of Strawberry Canyon. Tunnels 2 and 3, Boreholes 1, 1A, and 8 (1s complex), and Spring 4 occur in a group near the top of the Strawberry Canyon watershed. Boreholes 7, 7A, 7B, and 7C (7s complex) are located near the top of the watershed between Strawberry and East Strawberry canyons; and the Boreholes 10, 11, and 12 (10s complex) and the associated unnamed spring are located in the middle part of Strawberry Canyon at the Waterman fault.

Tunnels 2 and 3, Boreholes 1, 1A, and 8, and Spring 4 are located at approximately 5,300 feet amsl. Tunnels 2 and 3 were developed by advancing tunnels at spring sites. Spring 4 was developed by installation of Boreholes 1, 1A, and 8 in an area topographically above the spring location.

Boreholes 7, 7A, 7B, and 7C are located at approximately 5,200 feet amsl. Boreholes 10, 11, and 12 are located at approximately 4,150 feet amsl. Water from each of the tunnels and boreholes is collected into a common 4-inch above ground pipeline. Each of the tunnels, boreholes, and associated infrastructure is described below.

1.3.1.1 Tunnels 2 and 3

Tunnels 2 and 3 were advanced at spring sites. The tunnels were advanced to intercept the bedrock fracture network feeding the springs. The locations of the Tunnels 2 and 3 vaults are shown on Figure 2.

Both Tunnels 2 and 3 consist of concrete-lined, hand dug tunnels with gravel-lined floors. Water flows into the tunnels from bedrock fractures intersected by each tunnel. The total depths of Tunnels 2 and 3 are 37 and 89 feet, respectively. The maximum height in Tunnel 2 is approximately 4 feet, 8 inches and approximately 5 feet in Tunnel 3. Both tunnels are between 30 and 34 inches in width.

1.3.1.2 Horizontal Boreholes

The location of each of the horizontal boreholes is shown on Figure 2. The wellhead of each horizontal borehole is enclosed within a concrete vault secured with a heavy steel door. Boreholes 1, 1A, and 8 are enclosed within a common vault; Boreholes 10, 11, and 12 are enclosed within a common vault; and Boreholes 7, 7A, 7B, and 7C are enclosed within a common vault.

Typical horizontal borehole construction includes a conductor casing cemented from ground surface to a depth greater than 50 feet, and perforated screen installed from the conductor casing seal to the total depth of the borehole. The dimensions of the boreholes range between 2.5 and 2.875 inches in diameter, and each borehole is between 120 and 397 feet in length. The perforated screen and conductor materials consist of Schedule 40 galvanized steel pipe. The well screen includes 0.1875 to 0.25-inch holes drilled to allow the inflow of water.

Table 1 includes a summary of Arrowhead Springs borehole and tunnel construction.

Table 1. Summary of Borehole and Tunnel Construction

Horizontal Borehole No.	Borehole Length (feet)	Borehole Diameter (inches)	Seal Length (feet)	Casing Material	Conductor Casing Diameter (inches)	Screen Diameter (inches)	Screen Perforations (inches)
1	290	2.5	126	Sch 40 Galv. Steel	2	1.5	0.1875
1A	130	2.5	66	Sch 40 Galv. Steel	2	1.375	0.1875
7	290	2.875	126	Sch 40 Galv. Steel	2	1.25	0.1875
7A	230	2.875	95	Sch 40 Galv. Steel	2	1.25	0.1875
7B	397	2.875	121	Sch 40 Galv. Steel	2	1.25	0.1875
7C	390	2.5	168	Sch 40 Galv. Steel	2	1.25	0.1875
8	120	2.5	100	Sch 40 Galv. Steel	2	1.875	0.1875
10	305	2.5	162	Sch 40 Galv. Steel	2	1.5	.25
11	310	2.875	67	Sch 40 Galv. Steel	2	1.375	0.1875

Horizontal Borehole No.	Borehole Length (feet)	Borehole Diameter (inches)	Seal Length (feet)	Casing Material	Conductor Casing Diameter (inches)	Screen Diameter (inches)	Screen Perforations (inches)
12	320	2.875	152	Sch 40 Galv. Steel	2	1.375	0.1875
Tunnel No.	**Tunnel Length (feet)**	**Tunnel Height (feet)**	**Tunnel Width (inches)**	**---**	**---**	**---**	**---**
2	37	~ 4.66	~ 34	---	---	---	---
3	89	~ 5	~ 34	---	---	---	---
Notes: *Sch 40 Galv. Steel = Schedule 40 Galvanized Steel*							

1.4 ACCESS TO WATER COLLECTION SYSTEM AND PROJECT AREA

Access for all site activities including routine maintenance, emergency maintenance, and any applicable scientific studies will require the following site access:

- Helicopter flights;
- Vehicle access to the lower pipeline areas from SBNF Road 1N24;
- Drone flights for aerial photography to monitor decommissioning progress; and
- Hiking trails.

1.5 SITE SAFETY

A site-specific Health and Safety Plan (HASP) for this project, in accordance with applicable Occupational Safety and Health Administration requirements, is attached as Appendix A. Subcontractors working on the decommissioning work are responsible for ensuring that all personnel are thoroughly familiar with the HASP for the proposed work. Subcontractor personnel must be trained in the use of personal safety equipment required by the HASP. A copy of the HASP will be kept on site and will be available to all personnel for review.

1.5.1 Fire Prevention and Control Plan

A project-specific Fire Prevention and Control Plan has been prepared to outline the standards and practices used to prevent, report, control, and extinguish fires that may occur within the System area. The Fire Prevention and Control Plan details requirements for hot work activities that will be required during decommissioning. The Fire Prevention and Control Plan is provided in Appendix B of this document.

1.5.2 Hazardous Material Handling

Refueling of equipment and storage of fuel and other hazardous materials will not occur within 100 meters of Riparian Conservation Areas (perennial and seasonal streams, seeps, springs, and meadows).

2. UTILITIES

2.1 GENERAL

There are no utilities available at the spring sites. Subcontractors will be required to furnish all required fuel, power, lighting, heat, communications, and sanitary facilities for its operations. Water for the decommissioning program will be available from the spring sites.

3. EQUIPMENT

3.1 GENERAL

Equipment and tooling necessary to perform the specified work for the decommissioning program will be maintained in safe and efficient working condition. All demolition activities associated with removal of the borehole vault structures, pads, and retaining walls will be completed using hand tools including:

- Electric Jack hammers;
- Portable electronic inverters/generators;
- Sledgehammers;
- Hand tools;
- Pipe cutters;
- Positive displacement mud pump;
- Side-by-side vehicles and trailers; and
- Skid-steer.

3.2 MATERIALS

Materials that will potentially be used during the decommissioning program will consist of the following:

- Fuels for equipment, including diesel and/or gasoline;
- Motor oil for equipment;
- Personal protective equipment, including gloves, dust masks, face shields, eye protection, gators, etc.;
- Erosion control barriers, including straw waddles; and
- Neat cement in accordance with California Department of Water Resources (DWR) Bulletin 74-81 Section 23, B3:
    - Concrete used for drinking water systems will be in accordance with National Sanitation Foundation (NSF)/American National Standards Institute (ANSI) 61.

Applicable Safety Data Sheets (SDS) are included in Appendix C.

3.3 WASTE MANAGEMENT

Demolition materials will include electrical components, stainless steel, steel, and concrete. This material will be staged near each facility for transport to the SMBMI Campus via side-by-side vehicles with a trailer or will be lifted in/out by helicopter. Material to be removed via helicopter will be staged near the helipads. All material will be staged at the SMBMI Campus and will be loaded into roll-off bins for disposal. Trash shall be removed daily during all on-site activities for the protection of wildlife. Demolition debris will be sorted into inert materials including concrete,

stainless steel, and steel; electronic components; and batteries. The inert concrete and stainless steel pipe will be transported to the appropriate landfill facility. Electronics and batteries will be transported to appropriate recycling facilities.

4. MOBILIZATION/DEMOBILIZATION

4.1 GENERAL

BTB expects that the SMBMI Campus will serve as the equipment and crew mobilization point as well as the laydown yard. All equipment will either be mobilized to the site using side-by-side vehicles with a trailer or will be lifted in/out by helicopter. Demolition materials including concrete, stone, and piping will be brought down to the SMBMI Campus to be staged for loadout into roll-off bins for disposal.

4.2 HELICOPTER AND DRONE OPERATIONS

When mobilizing equipment and crews via helicopter, the SMBMI Campus will serve as the initial helipad. There are five helipads located in Strawberry Canyon that will be used during the decommissioning program. These helipads include:

- Pad #2;
- Pad #7;
- Meadow Pad;
- New Pad; and
- Strawberry Pad.

The Project Aviation Safety Plan (PASP) describes both helicopter and drone (small Unmanned Aircraft System or sUAS) usage to complete the decommissioning activities. The PASP is included as Appendix D. It is anticipated that helicopter flights will be conducted during normal business hours Monday through Friday. BTB anticipates a minimum of 40 flights per day (200 per week) for the duration of the decommissioning project.

BTB will provide Notification to Permit Administrator and Unit Aviation Officer (UAO) two days prior to any flight in order to:

- Determine if a limited operating period is needed for nesting/breeding bird season for flycatcher/vireo if determined to be present during the permit period;
- Avoid any concerns with other flights in area – de-conflict airspace if needed; and
- Provide Federal Interagency Communications Center (FICC)/dispatch with information to track flight if needed during fire season. Permittee will communicate with FICC/dispatch the day of any flight to ensure positive radio communication with dispatch over assigned frequency at beginning of day/flights into area and to close out last flight/exit from area at end of day.

5. SYSTEM DECOMMISSIONING

5.1 GENERAL

Decommissioning of the System includes mobilization to Strawberry Canyon, removal of all piping and electronics from each of the three borehole complex vault structures, pressure grouting each of the 10 boreholes, removal of the concrete vault structures, removal of the concrete pads and retaining walls at the vault structures, recontouring the ground surface, revegetation of the complex footprints and trails leading to the complexes, revegetation of the road leading to the 7s complex, and removal of aboveground stainless steel piping and pipe stands. While the associated piping will be removed, the Tunnels 2 and 3 structures will not be demolished. Underground piping will be cut-off below grade and will be abandoned in place.

5.2 PRE-DECOMMISSIONING MEETING

BTB will schedule a pre-decommissioning meeting with the United Stated Forest Service (USFS), SMBMI, and all applicable subcontractors prior to initiation of the System decommissioning project. The meeting will be used to facilitate open communication with USFS regarding project logistics, staging areas, flight plans, and sequence of events. Frequent communication is important to ensure that the team is aligned with regard to project strategy and key aspects of the decommissioning and biodiversity restoration. BTB will continue with open communication by scheduling monthly project check-in meetings throughout the decommissioning project.

5.3 INITIAL SITE SURVEY

An initial site survey will be completed prior to commencement of the decommissioning activities. The survey will document existing site conditions and will include photographic and video documentation of the System sites prior to disturbance. The survey will be completed by visual inspection of each complex and by completing an aerial drone survey of each site and the entire length of the pipeline.

5.4 REMOVAL OF PIPING AND ELECTRONICS

Prior to commencement of ground disturbance activities, erosion control barriers consisting of straw wattles will be placed bordering the work area. These barriers will be used to limit ground disturbance and to prevent sediment erosion near each work area. Straw wattles will be used at the 7s, 1s, and 10s vault structures as well as Tunnels 2 and 3 following material property data sheets provided by the selected manufacturer, similar to the example included in Appendix E.

All piping and electronic equipment from the 7s, 1s, and 10s vault structures as well as Tunnels 2 and 3 will be removed. Electronic equipment, including telemetry devices, water monitoring equipment, and solar panels will be removed using hand tools. Piping at each vault structure will be removed using pipe cutters and hand tools and will be cut to manageable lengths following hot work permit guidelines outlined in Appendix B. Electronic components and cut piping will be staged for removal.

5.5 BOREHOLE PRESSURE GROUTING

Each horizontal borehole will be filled with neat cement in accordance with California DWR Bulletin 74-81 Section 23, B3 and Bulletin 74-81 Section 23, C. Neat cement will be mixed using spring water at each borehole location. The total volume of grout necessary to completely fill each borehole from the surface orifice to the entire length of the borehole will be calculated. Pressure grouting of the boreholes will be completed using a positive displacement mud pump to pump neat cement into the 10 boreholes. Residual cement and associated waste will be containerized and staged for removal.

5.6 VAULT DEMOLITION

The vault structures, concrete pads, and retaining walls at the 7s, 1s, and 10s vault structures will be removed. The steel doors will be removed from the structures and the concrete will be demolished using electric jackhammers, sledgehammers, and hand tools. The concrete will be broken down to manageable-sized pieces and staged for removal. The vault structures at the Tunnels 2 and 3 will not be removed.

5.7 DISASSEMBLY AND REMOVAL OF PIPELINE AND PIPE STANDS

The entire length of the 15,000-foot aboveground water transmission pipeline will be removed. Crews will disassemble the stainless steel pipe by cutting it into manageable-sized pieces using pipe cutters following hot work permit guidelines outlined in Appendix B. All associated pipe stands will also be cut and removed. The stainless steel pipe will be staged for removal.

5.8 RECONTOURING AND REGRADING

Recontouring/regrading of the vault complexes, helipads at the 7s complex and above the tunnels (2s pad), and associated trails will be completed with a skid-steer. Ground disturbance associated with demolition and regrading activities will be limited to the existing vault complex and helipad footprints and associated trails.

Upon completion of recontouring and before revegetation activities commence, an aerial drone topographic survey will be conducted to document final grading of the slopes at the vault complexes, helipad footprints, and associated trails.

5.9 BIODIVERSITY RESTORATION

Upon completion of recontouring and regrading, native seed will be placed in the disturbed areas to restore the complex to pre-development conditions, as feasible. Once the areas are revegetated with native seed, existing wildlife will naturally infill the area. Biodiversity will be consistent with undisturbed areas of the canyon.

All piping associated with the spring complexes and the aboveground stainless steel pipeline down the canyon will be removed. It is assumed these areas consist of very discrete and small impacts where the pipe is secured to the rock. It is assumed that the boreholes and tunnel complexes will require weed treatment prior to seeding with native species. Coordination with USFS for the targeted restoration areas will be required.

5.9.1 Native Seed Mix

Each project feature area has unique vegetation communities and species biodiversity. Therefore, the seed mix used at each site will be specific to the habitat impacted and will represent the vegetation communities found at that location. Plant species identified during focused plant surveys within and adjacent to the project features can be found as Appendix F. Coordination with USFS for an approved seed mix list for each targeted area will be required.

5.9.2 Seed Collection

Restoration specialists will collect native seeds from areas within 5 miles of the restoration sites within the Strawberry Creek watershed over the course of four separate visits to account for different seed maturation times. If sufficient quantities of seed are not available, restoration specialists will coordinate with BTB and USFS for the purchase of additional seed from a native seed supplier.

5.9.3 Site Preparation and Seeding

The restoration crew will conduct an initial site preparation effort at each of the targeted restoration areas to treat all weeds present and de-compact the soil if needed. Hand-broadcast seeding will be conducted during the appropriate time of year (typically early spring) after the last frost and when temperatures have begun to warm. Seed will be lightly raked in to ensure good contact with the soil and minimize seed herbivory.

5.9.4 Weeding and Maintenance Monitoring

Following the seeding effort, the restoration crew will conduct six additional weeding and maintenance monitoring visits at each of the restoration sites. These are estimated to occur monthly during the growing season between April and September. Two methods of exotic plant eradication are proposed: mechanical removal and herbicide application (if needed).

The restoration maintenance efforts will be conducted under the supervision of a foreman and a biological monitor to ensure that the crews work within the approved areas and avoided sensitive resources.

During each visit, the crew will use mechanical methods of removal to treat and remove non-native species. These efforts will be performed by hand-pulling and with the use of hand equipment (i.e., shovels, saws, line trimmers, loppers, rakes, pruners, bags, etc.). Vegetation that does not pose a threat of propagating to other areas of the site can be reduced in size and left to decompose on site acting as mulch to suppress future non-native germination or resprout. Mechanical (hand pulling/hand tools) efforts will be scheduled while non-native plant species are in their growth stage, prior to seed development/maturity as to avoid further introduction of non-native species into the seedbank. Line trimming efforts will be scheduled while the non-native plant species are of a larger size but before seed maturation in order to exhaust the plants' energy and minimize chances of resprout.

If herbicide is determined to be an effective method of treatment, the effort will include either a mix of herbicide treatment and mechanical removal or may shift entirely to the application of herbicide to control emergence of annual exotics such as non-native grasses and forbs within

the riparian and upland areas. The restoration activities will require extreme care to avoid damage to recovering native species while still treating large numbers of invasive species that are germinating from the open canopy. Locations within a 15-foot distance from permanent water sources will be treated with an approved California aquatically approved herbicide (such as Polaris™ and Activator 90). All other locations will be treated with either Habitat®, Fusilade or, when girdling, with Garlon 4® Ultra herbicide. Glyphosate products such as Round-up will only be used pending USFS approval.

5.10 FINAL EROSION PLAN IMPLEMENTATION

Upon completion of recontouring and before revegetation takes place, final erosion control measures will be implemented. Final erosion control measures will include, where appropriate, digging of shallow holes bermed on the downgradient side and running perpendicular to the slope. The shallow holes will be dug in alternating fashion going downgradient, which would allow each hole to fill with runoff water before overflowing into the adjacent downgradient hole. This method is similar to the berm-terrace method described in the 2006 United States Department of Agriculture Erosion Control Treatment Selection Guide;[1] however, it will require less ground disturbance and stabilization and will leave a more natural surface. The shallow holes, once filled with runoff, will create an optimal environment for vegetation growth.

5.11 POST DECOMMISSIONING SURVEY

A post decommissioning site survey will be completed at the completion of decommissioning activities. The survey will document removal of the vault structures, associated vault and borehole piping, and water conveyance piping. The post decommissioning survey will include photographic documentation of each of the System sites after demolition and recontouring/regrading has occurred. The survey will be completed by visual inspection of each complex and by completing an aerial drone survey of each site and the entire length of the pipeline.

5.12 POST DECOMMISSIONING MEETING

BTB will schedule a post decommissioning meeting with the USFS and SMBMI, after completion of the final site survey. The meeting will be used to discuss final decommissioning results and coordination for the biodiversity restoration maintenance monitoring.

5.13 FINAL ACCEPTANCE

Restoration specialists will conduct a survey to determine success criteria and performance standards for measuring the establishment of native vegetation and the control of non-native vegetation within each of the targeted restoration areas. Based on the fact that the System has been in place in some form for over 130 years, establishment of native vegetation has occurred surrounding each area. Successful restoration of the System will be considered when 35 percent germination of the native seed is achieved. Upon reaching the established acceptance criteria, USFS will issue a formal approval of successful restoration.

[1] Rivas, T. (2006). Erosion control treatment selection guide (No. 0677 1203—SDTDC).

6. SEQUENCE OF OPERATIONS

6.1 GENERAL

Under optimal field conditions, BTB anticipates all work can be completed within 12 months following final agreement between BTB and the USFS. An estimated timeline by task and crew size is included below. It is anticipated that the decommissioning tasks will be completed in parallel with one another. A sequence of operations including project milestones, crew sizes, and flight schedule is included in Appendix G.

6.2 ESTIMATED DECOMMISSIONING COSTS

Costs for decommissioning the System depend on resources required to complete the work. Estimated decommissioning costs are included in Table 2. The estimated decommissioning costs are based on 2024 dollars. This Decommissioning Plan will be updated with actual costs prior to initiating any decommissioning activities.

Table 2. Estimated Cost

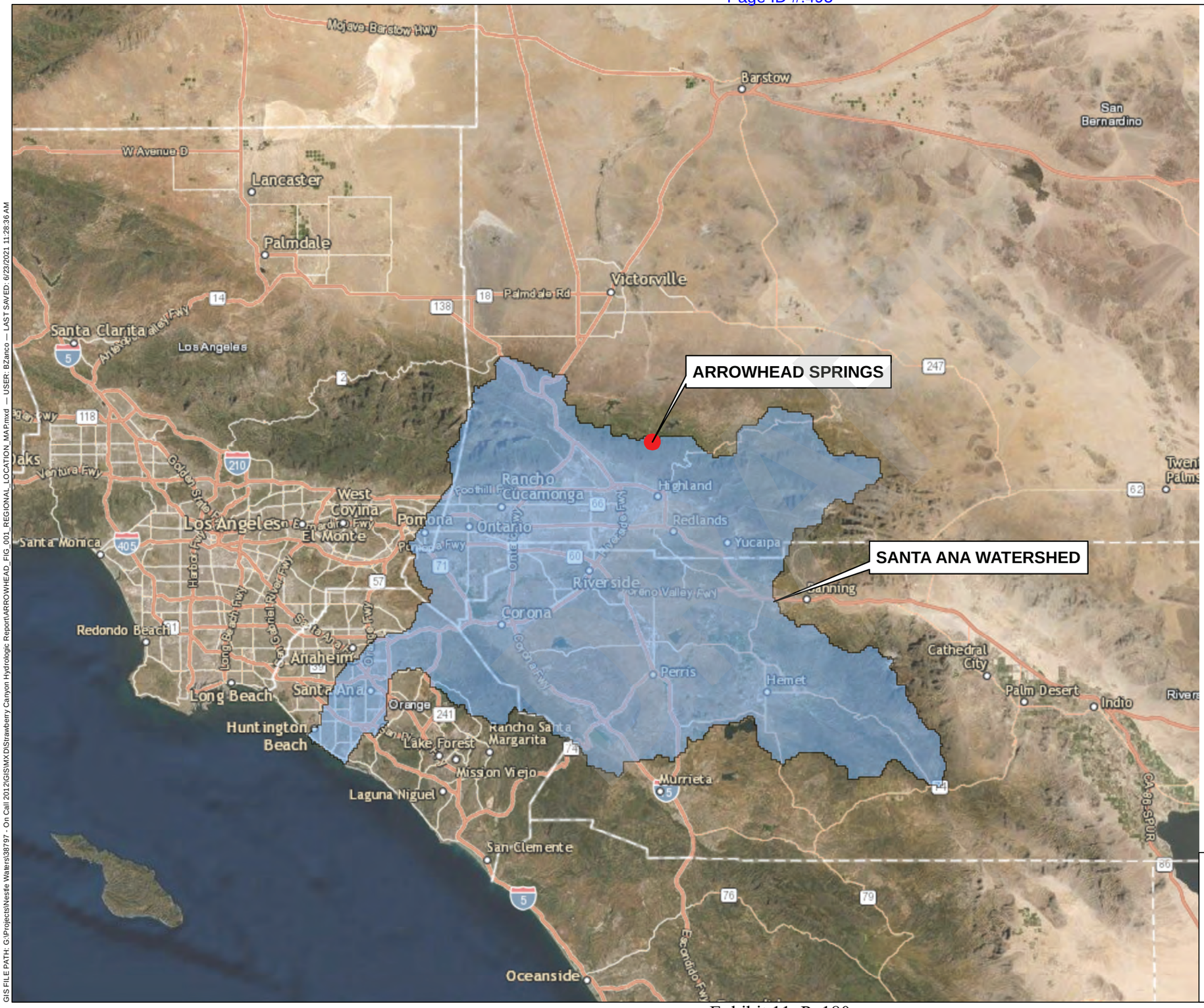
Item No.	Description	Units	Est. Qty.	Unit Price	Extended Price
1	Initial Site Survey	LS	1	$55,000	$55,000
	Flight Costs	HR	12	$2,000	$24,000
2	Mobilization/demobilization	LS	1	$261,800	$261,800
	Flight Costs	HR	80	$2,000	$160,000
3	Remove piping and electronics from 7s, 1s, and 10s vault structures	LS	3	$11,601	$34,803
	Pressure grout each of the horizontal boreholes (1,1A, 8, 7, 7A, 7B, 7C, 10, 11, 12)	EA	10	$14,210	$142,100
	Flight Costs	HR	120	$2,000	$240,000
4	Demolition/removal of 7s, 1/1A/8, and 10s vault complexes	Structures	3	$143,333	$430,000
	Flight Costs	HR	320	$2,000	$640,000
5	Remove aboveground stainless-steel pipe (4-inch) and pipe stands	LF	15,000	$236.27	$3,544,000
	Flight Costs	HR	960	$2,000	$1,920,000
6	Recontour/regrading of the road to No. 7 Borehole Complex, helipad, and ground surface beneath/surrounding vault	Acre	30,000	$1.24	$37,200
	Recontour/regrading of ground surface at 2s helipad location	SF	10,000	$1.24	$12,400
	Recontour/regrading of ground surface at 1/1A/8 vault location	SF	500	$10.50	$5,250
	Recontour/regrading of ground surface at Meadows vault location	SF	2,000	$10.50	$21,000

Item No.	Description	Units	Est. Qty.	Unit Price	Extended Price
	Topographic survey (7s complex and road, 1/1A/8 complex, 10s vault area)	N/A	1	$55,000	$55,000
	Flight Costs	HR	320	$2,000	$640,000
7	Biodiversity Restoration	LS	1	$675,000	$675,000
	Flight Costs	HR	60	$2,000	$120,000
8	Site Erosion Control	SF	100,000	$1.60	$160,000
	Flight Costs	HR	160	$2,000	$320,000
9	Post Decommissioning Survey	LS	1	$55,000	$55,000
	Flight Costs	HR	12	$2,000	$24,000
10	Project Oversight and Inspection	LS	1	$835,200	$835,200
	Subtotal				**$10,411,753**
	Contingency				**$1,561,776**
	Bid Total				**$11,973,530**

Assumptions:

1. *Recontour/revegetation includes cost of skid-steer and native seed.*
2. *Erosion control includes cost of both labor and materials.*
3. *Tunnels 2 and 3 structures will remain in place; however, associated piping will be removed.*
4. *Piping and vaults in road 1N24 and facilities on private land not included in bid.*

FIGURES

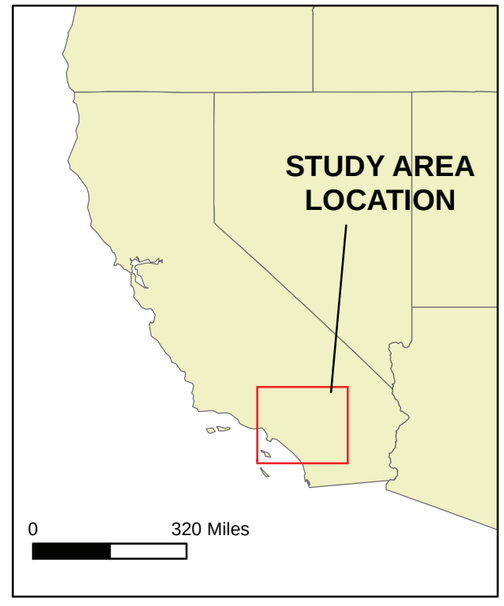


LEGEND

- ARROWHEAD SPRINGS
- SANTA ANA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.



0 10 20
Miles

HALEY ALDRICH

BLUETRITON BRANDS
SAN BERNARDINO, CALIFORNIA

ARROWHEAD SPRINGS
LOCATION MAP

OCTOBER 2024
SCALE: AS SHOWN

FIGURE 1

GIS FILE PATH: G:\Projects\Nestle Waters\38797 - On Call 2012\GIS\MXD\Strawberry Canyon Hydrologic Report\ARROWHEAD_FIG_001_REGIONAL_LOCATION_MAP.mxd — USER: BZanco — LAST SAVED: 6/23/2021 11:28:36 AM

STRAWBERRY CREEK WATERSHED

BOREHOLE 1, 1A, 8; SPRING 2, 3 AND 4; TUNNEL 2 AND 3 COMPLEX

EAST TWIN CREEK

USFS DIVERSION

WEST FORK CITY CREEK

BOREHOLE 7, 7A, 7B, 7C; SPRING NO.7 COMPLEX

BOREHOLE 10, 11, 12; SPRING NO.11 AND 12 COMPLEX

2,842 ACRES

CONFLUENCE

EAST TWIN CREEK

STRAWBERRY CREEK

LOAD STATION

TANK FARM

LEGEND

- MODEL DOMAIN
- SPRING COMPLEX
- STRAWBERRY CREEK WATERSHED
- WEST FORK CITY CREEK WATERSHED
- CREEK
- ARROWHEAD SPRINGS PIPELINE
- ARROWHEAD SPRINGS TANK FARM
- ARROWHEAD SPRINGS LOAD STATION

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

N

0 0.6 1.2
Miles

HALEY ALDRICH

BLUETRITON BRANDS
SAN BERNARDINO, CALIFORNIA

ARROWHEAD SPRINGS
SITE MAP

BLUETRITON

OCTOBER 2024
SCALE: AS SHOWN

FIGURE 2

GIS FILE PATH: G:\Projects\Nestle Waters\38797 - On Call 2012\GIS\MXD\Strawberry Canyon Hydrologic Report\ARROWHEAD_FIG_002_SITE_MAP.mxd — USER: BZanco — LAST SAVED: 7/12/2021 12:34:17 PM

APPENDIX A

Health and Safety Plan

HALEY ALDRICH

Project: 212213

SAFETY PLAN – *Arrowhead Decommissioning*

Date Accepted: Click here to enter text.	**Reviewer Name:** Choose an item.	
1.0 GENERAL INFORMATION		
Project Name: Arrowhead Decommissioning	Client: BlueTriton Brands	
Site Name & Location: Arrowhead Springs, San Bernardino, CA	Project #: 212213	
Field Work Start Date: 12/2/2024	Anticipated Field Work End Date: 10/3/2025	
2.0 PROJECT TEAM		
	Office Phone #	**Cell Phone #**
Client/Site Contact: Tam Pham	NA	909-229-1650
H&A Project Manager: `Adam Kneeling	602-760-2429	602-820-4177
H&A Field Safety Manager: Andrew Watson	NA	303-916-8679
H&A Site Safety Officer: Andrew Watson	NA	303-916-8679
H&A Field Team Members: Grady Robertson	602-760-2464	361-658-2776
Subcontractor Project Manager: Larry Lawrence	909-565-2342	NA
Other: Eric Fraser (Airwest Helicopters)	NA	619-843-6050

3.0 EMERGECY ACTION PLAN

Emergency Contact List

Contact	Name	Location	Phone
Hospital	St. Bernardine Medical Center	2101 N Waterman Ave, San Bernardino, CA 92404	909-883-8711
Police	San Bernardino Police Department	710 N D St, San Bernardino, CA 92410	911
Fire	San Bernardino County Fire Station 227	282 W 40th St, San Bernardino, CA 92407	911
National Spill Response Center	NA	NA	NA
Other	Click here to enter text.	Click here to enter text.	Click here to enter text.

Liberty Mutual Claim Policy – WC6Z11254100030

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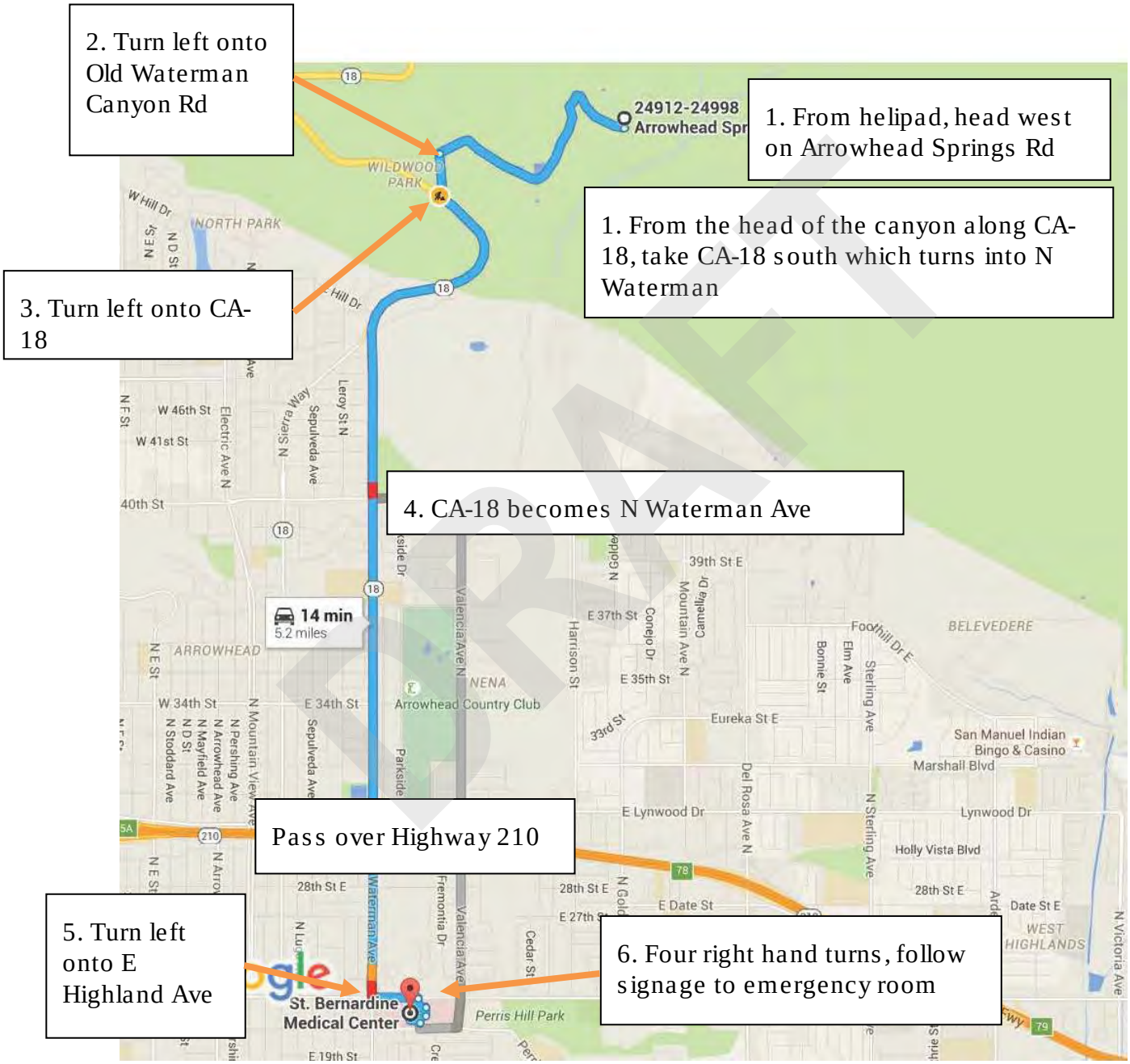
Project: 212213

SAFETY PLAN – *Arrowhead Decommissioning*

INSERT MAP/DIRECTIONS TO HOSPITAL



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4.0 SITE DESCRIPTION

Include relevant background information regarding the site, such as location, size, type of facility, topography, weather, infrastructure, security, previous site use, etc. Describe any other aspects of the site that may potentially affect the health, safety, or security of on-site personnel. If a site map is available, insert here.

The Arrowhead Springs site is located on the southern slope of the San Bernardino Mountains, at the northern edge of the Santa Ana River Basin. The Arrowhead Springs site is within the Strawberry Creek watershed, approximately 8.75 miles north-northeast of the City of San Bernardino, in Sections 30 and 31 of Township 2 North, Range 3 West, of the San Bernardino Baseline and Meridian. The location of the Strawberry Creek watershed, the Arrowhead Springs, boreholes, tunnels, and helipads are shown on Figure 1. The terrain of the canyon is rugged and steep in certain areas. Primitive to moderately established trails exist between spring locations and helipads in the interior of the canyon.

The Arrowhead Springs and portions of the spring water collection system are located within the boundaries of San Bernardino National Forest. The spring water collection infrastructure, including portions of the pipeline, water storage silos, and truck loading station are located on private property owned by the San Manuel Band of Mission Indians and referred to hereafter as the Arrowhead Campus. The Arrowhead Campus lies in the foothills of the San Bernardino Mountains approximately 4 miles below the Arrowhead Springs and is comprised of a former resort property that is currently empty.

5.0 SCOPE OF WORK

Include list of work activities to be performed during this project (contractor and subcontractor). Describe work activities to be performed, in sequence when possible, and include all tools and equipment to be used.

This HASP was prepared in support of BlueTriton Brand's (BTB) process for decommissioning the Arrowhead Springs water collection system (System) located in San Bernardino County, California. Decommissioning of the System includes removal of all spring complex infrastructure including vaults, boreholes, and water conveyance pipeline.

Work Activity 1: Mobilization/Demobilization
Work Activity 2: Initial Site Survey – Visual inspection of each complex & aerial drone survey of pipeline.
Work Activity 3: Removal of Piping & Electronics – Removal of piping & electronics from each vault complex including telemetry & water monitoring equipment. Will require use of hand tools.
Work Activity 4: Borehole Pressure Grouting – Pressure grout each of the 10 horizontal boreholes with neat cement using positive displacement pump.
Work Activity 5: Vault Demolition – Demolish 3 vault structures and concrete pads using hand tools & electric jackhammers.
Work Activity 6: Pipeline Removal – Disassemble & remove 15,000 ft of pipeline. Pipe will be removed by either side-by-side with a trailer or via helicopter.
Work Activity 7: Recontouring/Regrading & Biodiversity Restoration – Recontour & regrade vault complex footprints, helipads, and associated trails using a skid-steer. Upon completion of recontouring/regrading, native seed will be placed in disturbed areas.

SAFETY PLAN – *Arrowhead Decommissioning*

Work Activity 8: Final Erosion Plan Implementation – Digging of shallow bermed holes to capture stormwater runoff using a skid-steer.
Work Activity 9: Post Decommissioning Survey – Visual inspection of each complex & aerial drone survey of pipeline.
The following activities are subject to specific requirements and/or regulation. Additional control measures and documentation may be required.

• Confined Space Entry • Hot Work • Hoisting/ Lifting • Working at Heights	• Excavation • Work on/ Over Water • Handling/ Exposure to Acutely Toxic Substances

6.0 RISK ASSESSMENT & HAZARD IDENTIFICATION

List significant safety hazards and/or environmental impacts and how to control and/or eliminate hazards and/or impacts

Hazards and/or Environmental Impacts	***Hazard Mitigation, Elimination and/or Controls***
Remote work area	***Work in groups of 2+, each group should have a GPS communication device and/or radio.***
Snakes	***All field staff will wear snake gators.***
Lifting operations (helicopter)	***See Project Aviation Safety Plan (PASP)***
Work from heights	***See JHA***
Hot work	***See JHA***
Heavy Equipment (skid-steer)	***Use spotter, stay in line-of-site, do not approach while operating.***

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SAFETY PLAN – *Arrowhead Decommissioning*

Site Hazards - Weather ☒ Cold Temperatures ☒ High Winds ☒ Hot Temperatures ☒ Lightning Storms ☐ Tornadoes **Site Hazards – Biological** ☒ Aggressive Wildlife ☒ Insects ☒ Poisonous Plants ☒ Poisonous Wildlife **Site Hazards - Land/Terrain** ☐ Public Road or Right of Way ☐ Economically Depressed ☐ Railroad Right of Way ☒ Remote Work Area ☐ Work Over/Near Water ☒ Steep Slopes ☒ Slips/Trips/Falls ☐ SIMOPS **Site Hazards – Miscellaneous** ☐ Urban Fill ☐ Night Work ☐ Extended Shift	**OSHA Regulated Work** ☐ Excavation/Trenching ☐ Confined Space Entry ☐ Control of Hazardous Energy (LOTO) ☒ Crane or Lifting Operations ☒ Work From Heights ☒ Hot Work **Chemical** ☐ Corrosive Materials ☐ Flammable/Reactive Chemicals **Other Hazards (Crane or Boom work, etc.)** ☐ Compressed Gas ☐ Energized Equipment ☒ Ground Disturbance ☒ Hand/Power Tools ☒ Heavy Equipment (Excavators, Drill Rigs, Backhoe, etc..) ☒ Heavy Manual Lifting/Moving ☒ Ladders (Portable/Fixed) ☒ Noise ☐ Overhead/Underground Utilities ☒ Repetitive Motion ☐ Rotating Equipment ☒ Sharp Objects ☐ Structural Integrity ☐ Traffic ☐ Other: Click or tap here to enter text. ☐ Other: Click or tap here to enter text.

Specific Activity Hazards and Precautions

Specific Activity Hazards include 1) poison oak, which is known to be present in the canyon, 2) a remote work location, and 3) entering and exiting helicopters; precautions will be taken to address hazards associated with each of these activities.

1) Poison Oak (from http://www.cdc.gov/niosh/topics/plants)

Recommendations for Protecting Workers from Poison Oak

- Know the risk of exposure to poisonous plants
- Know how to identify poisonous plants
- Know how to prevent exposure to poisonous plants
- Know what to do if exposed to poisonous plants

Risk of Exposure to Poisonous Plants

Poison ivy, poison oak, and poison sumac release an oil urushiol, when the leaf or other plant parts are bruised, damaged, or burned. When the oil gets on the skin, an allergic reaction referred to as contact dermatitis occurs in most exposed people as an itchy red rash with bumps or blisters. When exposed to 50 micrograms of urushiol, an amount that is less than one grain of table salt, 80 to 90 percent of adults will develop a rash. **The rash, depending upon where it occurs and how broadly it is spread, may significantly impede or prevent a person from working.** Although over-the-counter topical medications may relieve symptoms for most people, immediate medical attention may be required for severe reactions, particularly when exposed to the smoke from burning these poisonous plants. **Burning these poisonous plants can be very dangerous** because the allergens can be inhaled, causing lung irritation.

Poison Oak Identification

- Typically a shrub with leaves of three, similar to poison ivy,
- Pacific poison oak may be vine-like, and

- May have yellow or green flowers and clusters of green-yellow or white berries.

Poison Oak Prevention

- Workers can prevent contact with poisonous plants by taking these steps:
  - **Wear long sleeves, long pants, boots, and gloves.**
  - Wash exposed clothing separately in hot water with detergent.
- Barrier skin creams, such as a lotion containing bentoquatam, may offer some protection before contact.
  - Barrier creams should be washed off and reapplied twice a day.
- **After use, clean tools with rubbing alcohol (isopropanol or isopropyl alcohol) or soap and lots of water. Urushiol can remain active on the surface of objects for up to 5 years.**
  - **Wear disposable gloves during this process.**
- Do not burn plants that may be poison ivy, poison oak, or poison sumac.
  - Inhaling smoke from burning plants can cause severe allergic respiratory problems.

Poison Oak First Aid

Workers who have come in contact with poisonous plants should:

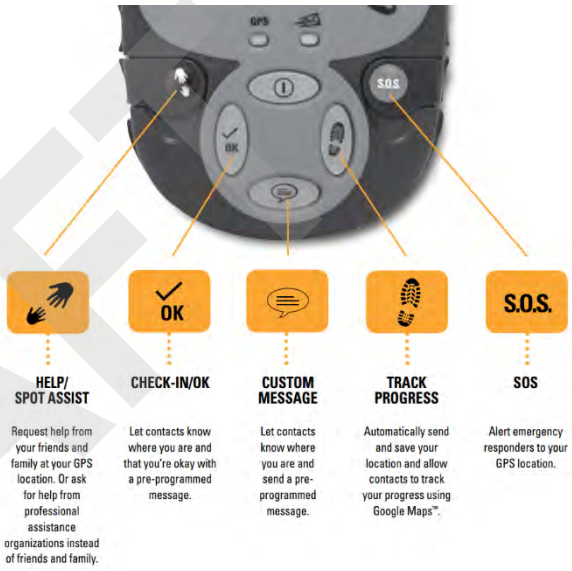
- Use specialized poison plant washes, degreasing soap (such as dishwashing soap) or detergent, and lots of water.
  - Rinse frequently so that wash solutions do not dry on the skin and further spread the urushiol.
- Scrub under nails with a brush.
- Apply wet compresses, calamine lotion, or hydrocortisone cream to the skin to reduce itching and blistering.
  - Follow the directions on any creams and lotions. Do not apply to broken skin, such as open blisters.
  - Oatmeal baths may relieve itching.
- An antihistamine such as diphenhydramine (Benadryl) can be taken to help relieve itching.
  - Follow directions on the package.
  - Drowsiness may occur.
  - If children come in contact with work clothing contaminated with urushiol, a pediatrician should be contacted to determine appropriate dosage.

- In severe cases or if the rash is on the face or genitals, seek professional medical attention.
- Call 911 or go to a hospital emergency room if the worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had a severe reaction in the past.

2) Remote Work Location

Remote Work Location will require satellite technology to maintain communication.

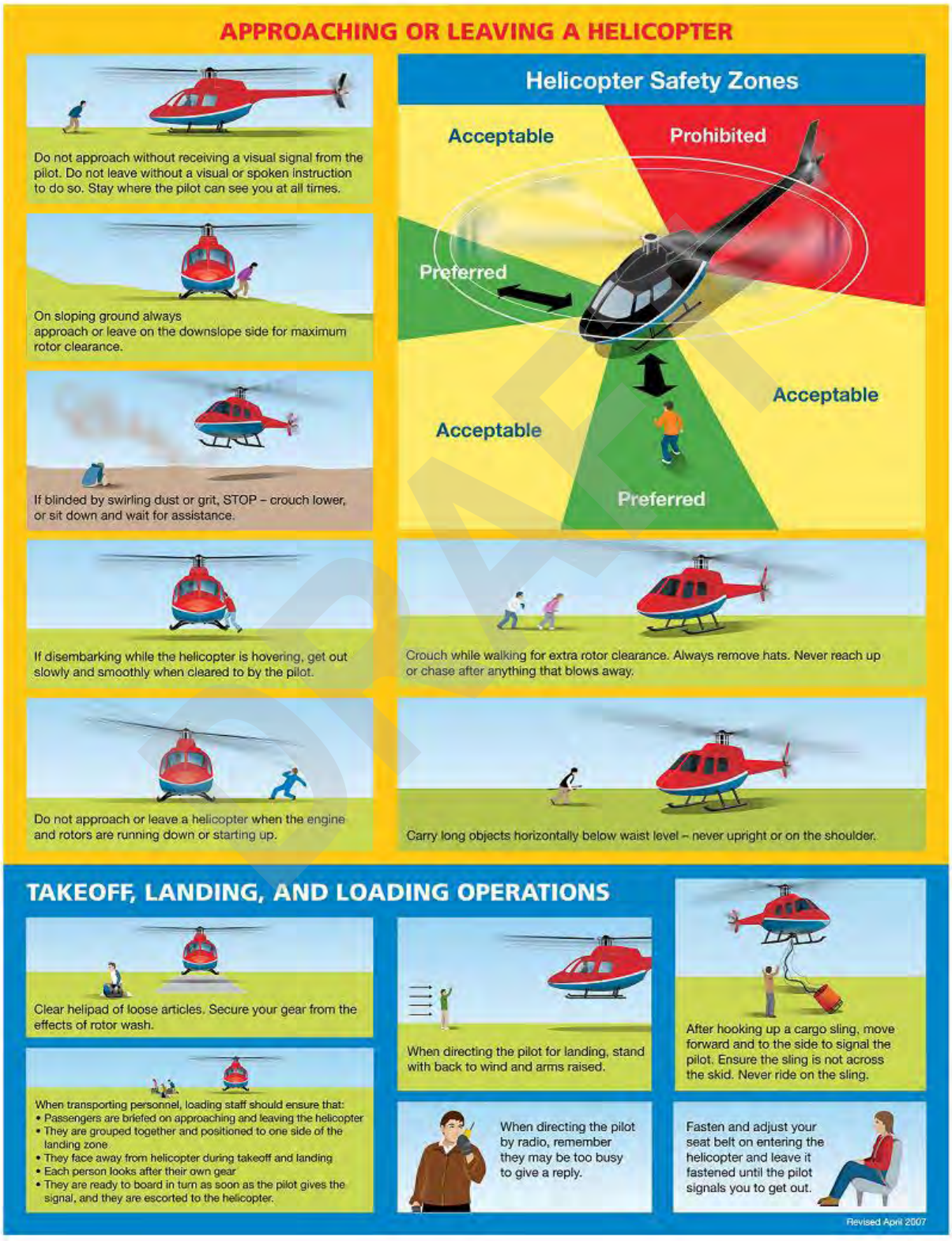
- Field staff will use a SPOT Gen 2 Satellite Personal Tracker,
- Custom messages will be sent such as request for helicopter pickup with GPS location,
- Can request Emergency Response and will be sent with GPS location.
- Management can track the location of staff with “Track” check-ins.



3) Entering and Exiting Helicopters

1. **Stay away from the rear of the helicopter.**
2. Crouch low before getting to and going under the main rotor.
3. Approach the helicopter from the side or front, but never out of the pilot's line of vision.
4. Hold firmly to hats and loose articles.
5. Never reach up or dart after a hat or other object that might be blown off or away.
6. Protect eyes by shielding with a hand or by squinting.
7. If suddenly blinded by dust or a blowing object, stop and crouch lower or, better yet, sit down and wait for help.
8. Do not try to grope or feel the way to or from the helicopter.
9. Remain clear of an elevated heliport platform (roof top or helideck) until the pilot gives the signal to board the helicopter.
10. If the takeoff site is on a hill, passengers should not approach or depart the helicopter on the upslope side. Avoid the area of lowest rotor clearance.
11. **Approach the helicopter from the front, never the rear**.
12. Never unbuckle seatbelts in preparation for departing the helicopter until told to do so.
13. Never to open any door (passenger or cargo) unless directed to do so by the pilot or another crew member.
14. Never remove personal gear until instructed to do so.
15. Use caution when removing cargo from a helicopter so that the restraining devices do not become tangled in the main or tail rotors.
16. Depart downhill if the landing site is on a hill and always walk around the front of the helicopter, never the rear, when walking around the helicopter to avoid the area of lowest rotor clearance.

SAFETY PLAN – *Arrowhead Decommissioning*



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SAFETY PLAN – *Arrowhead Decommissioning*

7.0 PERSONAL PROTECTIVE EQUIPMENT & SAFETY SUPPLIES

Personal Protective Equipment (PPE)

										
☒	☒	☒	☒	☒	☒	☐	☐	☐	☐	☐
Hard Hat	Safety Eyewear	Safety Vest	Safety Toed Shoes	Protective Gloves	Hearing Protection	Protective Clothing	Respiratory Protection	PFD	Face Shield	Fall Protection

☐ FRC/Arc Flash Clothing ☒ Clothing – Long Sleeves	☐ Type of Gloves: Choose an item. ☐ Type of Protective Clothing: Click or tap here to enter text.

Safety Supplies

☒ First Aid Kit ☒ Emergency Eyewash: Choose an item. ☒ Fire Extinguisher ☒ Safety Cones/Barricades/Delineators ☐ Safety Signage ☒ Air horn/Signaling Device	☒ Two-way radios ☒ Satellite Phone ☐ Other: Click or tap here to enter text. ☐ Other: Click or tap here to enter text. ☐ Other: Click or tap here to enter text. ☐ Other: Click or tap here to enter text.

8.0 CERTIFICATION AND TRAINING

Training: ***Please list required training per specific role.***

Role	Required Training/Certification	Work Activity #s
NA	Choose an item.	Click here to enter text.
Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Choose an item.	Click here to enter text.
Click here to enter text.	Choose an item.	Click here to enter text.
Other (specify): Click here to enter text.	Choose an item.	Click here to enter text.

I certify that all Haley & Aldrich personnel covered under this Safety Plan on this Project are trained and qualified to perform the task(s) they have been assigned.

Field Safety Manager or Delegate Signature and Date

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Project: 212213

SAFETY PLAN – *Arrowhead Decommissioning*

9.0 SUBCONTRACTOR MANAGEMENT

Please list all subcontractors below along with the activities they will perform.

Subcontractor Company	Work Activities	JHA
Well Tec	Decommissioning/Demolition, Erosion Control, Pressure Grouting	Y ☒ N ☐
Airwest Helicopters	Mobilization/Demobilization, Waste Management	Y ☒ N ☐
Click here to enter text.	Click here to enter text.	Y ☐ N ☐
Click here to enter text.	Click here to enter text.	Y ☐ N ☐

10.0 PUBLIC SAFETY

Please assess all Work Activities for impact to the general public. Vehicle/truck traffic, work in the right-of-way, dust, vapors, and noise are common issues that may negatively impact the general public. Attach any additional Plans (Temporary Traffic Control Plan, Dust Suppression Plan, Noise or Vibration Monitoring Plan, etc.) to this document for reference. Also, document all potential hazards and to the general public, and the mitigating controls, within the Job Hazard Assessment/Analysis.

11.0 INCIDENT REPORTING PROTOCOL

H&A Personnel or Site Safety Officer shall notify the Project Manager or Field Safety Manager of any incidents that may occur while on the project **as soon as safely possible and WITHIN 2 HOURS** with the following information:

- ✓ Who was involved in the incident
- ✓ What is understood to have occurred (investigation pending)
- ✓ Where the incident occurred
- ✓ When did the incident occur
- ✓ Initial assessment of why incident occurred (investigation pending)
- ✓

Incident types include:

- Injury/illness to project personnel or to the public
- Motor Vehicle Incident
- Property/Equipment Damage
- Utility Strike (whether at-fault or not-at-fault)
- Overhead Line Strike
- Release to the Environment
-

An initial Gensuite report is due within 24 hours of the incident.

GENSUITE XXXX (insert QR Code)

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SAFETY PLAN – *Arrowhead Decommissioning*

12.0 SIGNATURES

All Site workers working under this Safety Plan must write name and date below with their signature, after review and prior to starting work.

Printed Name	Signature	Organization	Date

11.0 CHANGE LOG

Indicate changes made on the Safety Plan in the table below.

Date	Rationale	Description	Section	Accepted By

HALEY ALDRICH

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SAFETY PLAN – *Arrowhead Decommissioning*

JOB HAZARD ASSESSMENT - HAZARD IDENTIFICATION ***Check if the hazard is present and then describe the hazard under "hazard description." The Contractor shall complete the "Mitigation and Controls." JHAs or similar can be attached in place of this section but must include all hazards associated with the tasks to be performed as well as the mitigating controls to be implemented.***	
HAZARDOUS ENERGY SOURCES	
Motion – The change in position of objects or substances. *Examples: vehicle, vessel or equipment movement; flowing water; wind; and body positioning when lifting or bending.*	**Gravity** – The force caused by the attraction of all other masses to the mass of the earth. *Examples: falling object, collapsing roof, and a body tripping or falling.*
Mechanical – The energy of the components of a mechanical system, i.e., rotation, vibration, or motion within an otherwise stationary piece of equipment or machinery. *Examples: rotating equipment, compressed springs, drive belts, conveyors and motors*	**Electrical** – The presence and flow of an electric charge. *Examples: power lines, transformers, static charges, lightning, energized equipment, wiring, and batteries.*
Pressure – Energy applied by a liquid or gas that has been compressed or is under a vacuum. *Examples: pressure piping, compressed cylinders, control lines, vessels, tanks, hoses, and pneumatic and hydraulic equipment*	**Temperature** – The measurement of differences in the thermal energy of objects or the environment, which the human body senses as either hot or cold. *Examples: open flame; ignition sources, hot or cold surfaces, liquids or gasses; steam ; friction, and general environmental and weather conditions*
Chemical – The energy present in chemicals that inherently, or through reaction has the potential to create a physical or health hazard to people, equipment, or the environment. *Examples: flammable vapors, reactive hazards, carcinogens or other toxic compounds, corrosives, pyrophorics, combustibles, oxygen-deficient atmospheres, welding fumes, and dusts*	**Biological** – Living organisms that can present a hazard. *Examples: animals, bacteria, viruses, insects, blood-borne pathogens, improperly handled food, contaminated water*
Radiation – The energy emitted from radioactive elements or sources and naturally occurring radioactive materials (NORM) *Examples: lighting issues, welding arcs, solar rays, microwaves, lasers, X-rays, NORM scale*	**Sound** – Sound is produces when a force causes an object or substance to vibrate and the energy is transferred through the substance in waves. *Examples: equipment noise, impact noise, vibration, high-pressure release, and the impact of noise to communication*
OSHA Level D PPE: Hard Hat, Hi-Visibility Vest, Safety Glasses, Safety-Toe Boots, Hazard-Specific Gloves (chemical/ cut/ abrasion resistant, etc.) ***Additional PPE: Hearing Protection, Face Protection, Goggles, Respiratory Protection, Personal Floatation Device, Clothing (FRC, Tyvek, etc.)***	

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SAFETY PLAN – *Arrowhead Decommissioning*

JOB HAZARD ASSESSMENT

Work Activity from section 5.0 scope of work	***Hazard***	***Mitigation and Controls***	***Required PPE***
Mobilization/Demobilization	• Boarding/de-boarding helicopter • Manual lifting • S/T/F • Struck-by	• Refer to PASP for detailed instructions • Keep load close to body, proper form, use 2 people, reduce travel distance • Remove, highlight, or block access to trip hazards; scan site for potential hazards • Stand clear of moving vehicles/equipment; wear reflective gear; make eye contact with operators	Level D + hearing protection
Site Surveys/Drone Operation	• S/T/F • Biological • Remote work • Propelled particulates • Air traffic/high objects	• Remove, highlight, or block access to trip hazards; scan site for potential hazards • Be aware of snakes, spiders, ticks; wear long pants, sleeved shirts, gators, insect repellent/DEET • Work in groups of 2+, have GPS/2-way radio on person • Keep hands away from propellers • Use FAA certified drone pilot, ensure all batteries fully charged; check drone compass calibration & ensure home point is established	Level D

SAFETY PLAN – *Arrowhead Decommissioning*

Demolition	• Falling objects • Pinch points • Noise	• Do not work beneath/beside unstable structures; be aware of surroundings; wear hard hat, disassemble/demolish structures in logical order to prevent toppling • Avoid placing hands in pinch points • Wear hearing protection	Level D + hearing protection
Pressure Grouting	• Contact with wet/dry cement • Pressurized lines	• Avoid contact with eyes, skin; wear safety glasses with side shields and nitrile gloves • Stay out of line of fire/potential path of equipment if it were to release; ensure subcontractors have installed whip checks and inspected all hose connections for damage	Level D + hearing protection
Pipeline Removal	• Falling objects • Work from heights • Lifting operations (helicopter) • Hot work	• Do not work beneath/beside unstable structures; be aware of surroundings; wear hard hat, disassemble/demolish structures in logical order to prevent toppling • Utilize proper harnesses; refer to subcontractor JHA • Refer to PASP	Level D + hearing protection

SAFETY PLAN – *Arrowhead Decommissioning*

Recontour/Regrade/Erosion Control	• S/T/F • Struck-by	• Remove, highlight, or block access to trip hazards; scan site for potential hazards • Stand clear of moving vehicles/equipment; wear reflective gear; make eye contact with operators	Level D
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Click here to enter text.	Click here to enter text.	Click here to enter text.	Click here to enter text.
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SAFETY PLAN – *Arrowhead Decommissioning*

JOB HAZARD ASSESSMENT SIGNATURE PAGE

All site workers must review Job Hazard Assessments for those activities which they will perform. Signature below is acknowledgement of review.

Name	Company	Signature	Date

APPENDIX B

Fire Prevention and Control Plan

28 February 2019

ATTACHMENT C
FIRE CONTROL PLAN

For Activities Conducted in Conjunction With
San Bernardino National Forest Special Use Permit No. FCD728503
BlueTriton Brands (Permittee)

1. SCOPE

Operation of the Arrowhead Springs water collection and conveyance system, authorized by SUP No. FCD728503, includes periodic maintenance procedures such as pipeline repairs and other tasks that may constitute Hot Work and have the potential for fire risk. The provisions set forth below outline the standards and practices used to prevent, report, control, and extinguish fires that may occur within the General Permit Area.

2. RESPONSIBILITIES

a. Permittee Representative

Role	Responsibility	Contact
Springs Representative	Responsible for project execution and oversight.	Senior Springs Resource: Tam Pham 909-229-1650

b. Permittee

i. Shall abide by the requirements of this Fire Control Plan.

ii. Shall take all steps necessary to prevent employees, contractors, subcontractors and their employees from igniting fires. No controlled burns are required or proposed to complete activities defined under the permit.

iii. Shall permit and assist in periodic testing and inspection of required fire equipment. Permittee shall ensure compliance with specific fire precautionary measures in the Fire Control Plan before beginning operations during the fire precautionary period and shall update precautionary measures when operations change.

iv. Shall designate a Fire Patrol Person authorized to act on behalf of Permittee in fire prevention and suppression matters, and to remain on-site for the duration of permitted hot work.

v. Shall work with the local SBNF Fire Prevention Officer (FPO) prior to commencing any hot work at the site.

c. Forest Service

i. The United States Forest Service (USFS) may conduct one or more inspections for compliance with this Fire Control Plan. The number, timing, and scope ofsuch inspections will be at the discretion of agency employees responsible for Permit Administration. Such inspections do not relieve the Permittee of responsibility for correcting violations of the Fire Control Plan or for fire safety in general.

3. DEFINITIONS

The following definitions shall apply:

- **Active Landing:** A location the contractor may be skidding logs into, or performing other operations such as delimbing, log manufacturing, and chipping logs. Except for EV and E days, loading logs or stockpiling chips only, on a cleared landing, does not constitute an Active Landing.
- **Hot Saw:** A harvesting system that employs a high-speed (>1,100 rpm) rotating felling head, i.e., full rotation lateral tilt head.
- **Mechanical Operations:** The process of felling, skidding, chipping, shredding, masticating, piling, log processing, and/or yarding which requires the use of motorized power which includes, chainsaws, chippers, motorized carriages, masticators, stroke delimbers, skidders, dozers etc.

4. TOOLS AND EQUIPMENT

The Contractor shall comply with the following requirements during the fire precautionary period, as defined by unit administering contracts:

The Fire Precautionary Period is set by the State of California which is April 1 through December 1 of any year.

This contract ☐ requires, ☐ does not require, a Fire Box and associated Fire Tools according to CPRC Section 4428.

A. **Fire Tools and Equipment**: Contractor shall meet minimum requirements of Section 4428 of the California Public Resources Code (C.P.R.C.). Fire tools kept at each operating landing shall be sufficient to equip all employees in the felling, yarding, loading, chipping, and material processing operations associated with each landing. Fire equipment shall include two tractor headlights for each tractor dozer used in Contractor's Operations. Tractor headlights shall be attachable to each tractor and served by an adequate power source. All required fire tools shall be maintained in suitable and serviceable condition for firefighting purposes.

Trucks, tractors, skidders, pickups and other similar mobile equipment shall be equipped with and carry at all times a size 0 or larger shovel with an overall length of not less than 46 inches and a 2-1/2 pound axe or larger with an overall length of not less than 28 inches.

Where cable yarding is used, Contractor shall provide a size 0 or larger shovel with an overall length of not less than 46 inches and a filled backpack can (4 or 5 gallon) with hand pump within 25 feet of each tail and corner block.

B. **Fire Extinguishers**: Contractor shall equip each internal combustion yarder, fuel truck, and loader with a fire extinguisher for oil and grease fires (4-A:60-B:C).

Skidders and tractors shall be equipped with a minimum 5-BC fire extinguisher.

All Fire Extinguishers shall be mounted, readily accessible, properly maintained and fully charged.

Contractor shall equip each mechanized harvesting machine with hydraulic systems, powered by an internal combustion engine (chipper, feller/buncher, harvester, forwarder, hot saws, stroke

delimber, etc), except tractors and skidders, with at least two 4-A:60-B:C fire extinguishers or equivalent.

C. **Spark Arresters and Mufflers:** Contractor shall equip each operating tractor and any other internal combustion engine with a spark arrester, except for motor vehicles equipped with a maintained muffler as defined in C.P.R.C. Section 4442 or tractors with exhaust-operated turbochargers. Spark Arresters shall be a model tested and approved under Forest Service Standard 5100-1a as shown in the. National Wildlife Coordinating Group Spark Arrester Guide, Volumes 1 and 2, and shall be maintained in good operating condition. Every motor vehicle subject to registration shall at all times be equipped with an adequate exhaust system meeting the requirements of the California Vehicle Code.

D. **Power Saws:** Each power saw shall be equipped with a spark arrester approved according to C.P.R.C. Section 4442 or 4443 and shall be maintained in effective working order. An Underwriters Laboratories (UL) approved fire extinguisher containing a minimum 14 ounces of fire retardant shall be kept with each operating power saw. In addition, a size 0 or larger shovel with an overall length of not less than 38 inches shall be kept with each gas can but not more than 300 feet from each power saw when used off cleared landing areas.

This contract ☐ requires, ☐ does not require, Section 4E of the Fire Plan.

E. **Tank Truck or Trailer:** Contractor shall provide a water tank truck or trailer on or in proximity to Contract Area during Contractor's Operations hereunder during Fire Precautionary Period. When Project Activity Level B or higher is in effect, a tank truck or trailer shall be on or immediately adjacent to each active landing, unless otherwise excepted when Hot Saws or Masticators are being used. See Section 6 for specific contract requirements.

The tank shall contain at least 300 gallons of water available for fire suppression. Ample power and hitch shall be readily available for promptly and safely moving tank over roads serving Contract Area. Tank truck or trailer shall be equipped with the following:

(1) Pump, which at sea level, can deliver 23 gallons per minute at 175 pounds per square inch measured at the pump outlet. Pumps shall be tested on Contract Area using a 5/16 inch orifice in the Forester One Inch In-Line Gauge test kit. Pump shall meet or exceed the pressure value in the following table for nearest temperature and elevation:

Temp	Sea Level		1,000 Feet		2,000 Feet		3,000 Feet		4,000 Feet		5,000 Feet		6,000 Feet		7,000 Feet		8,000 Feet		9,000 Feet		10,000 Feet	
55	179	23	174	23	169	23	165	22	161	22	157	22	153	22	150	21	146	21	142	21	139	21
70	175	23	171	23	166	22	162	22	158	22	154	22	150	21	147	21	143	21	139	21	136	20
85	171	23	168	23	163	22	159	22	155	22	151	21	147	21	144	21	140	21	136	20	133	20
100	168	23	164	23	159	22	155	22	152	22	148	21	144	21	141	21	137	20	133	20	131	20
	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM	PSI	GPM

The pump outlet shall be equipped with 1-1/2 inch National Standard Fire Hose thread. A bypass or pressure relief valve shall be provided for other than centrifugal pumps.

(2) 300 feet of 3/4-inch inside diameter rubber-covered high-pressure hose mounted on live reel attached to pump with no segments longer than approximately 50 feet, when measured to the extreme ends of the couplings. Hose shall have reusable compression wedge type 1-inch brass or lightweight couplings (aluminum or plastic). One end of hose shall be equipped with a coupling female section and the other end with a coupling male section. The hose shall, with the nozzle closed, be capable of withstanding 200 PSI pump pressure without leaking, distortions, slipping of couplings, or other failures.

(3) A shut-off combination nozzle that meets the following minimum performance standards when measured at 100 P.S.I. at the nozzle:

	G.P.M.	Horizontal Range
Straight Stream	10	38 feet
Fog Spray	6 – 20	N/A

(4) Sufficient fuel to run the pump at least 2 hours and necessary service accessories to facilitate efficient operation of the pump.

When Contractor is using Hot Saws or Masticators, an additional 250 feet of light weight hose, approved by the Forest Service, shall be immediately available for use and be capable of connecting to the 300 feet of hose and appurtenances in (2) and (3) above.

This equipment and accessories shall be deliverable to a fire in the area of operations and is subject to the requirements for each specific activity level identified in Section 6.

5. GENERAL

a. State Law. The Permittee shall comply with all applicable laws of the State of California.

b. Permits Required. The Permittee must secure a special written 'hot work' permit from the District Ranger or designated representative before engaging in any burning, cutting, or welding.

c. Regulations for Burning. No fires are required or proposed to complete activities defined under the Permit.

d. Smoking and Fire Rules. Smoking is not permitted in any of the work areas defined in the Permit.

e. Storage and Parking Areas. Equipment service areas, parking areas, and gas and oil storage areas shall be cleared of all flammable material for a radius of at least 10 feet. Small mobile or stationary internal combustion engine sites shall be cleared of flammable material for a distance of at least 10 feet from such engine.

f. Welding. Permittee shall confine welding activity to cleared areas having a minimum radius of 10 feet measured from place of welding.

g. Oil Filter and Glass Jugs. Permittee shall remove from National Forest lands oily rags and used oil filters and shall prohibit use of glass bottles and jugs in Permittee's operations.

h. Communications. Permittee shall furnish an agreed-upon communication system connecting each operation with the designated Forest Service Dispatch Center. The communications system shall be operable during the Permittee's operation in the fire precautionary period.

i. Reporting Fires: As soon as feasible, but no later than 15 minutes after initial discovery, Contractor shall notify Forest Service of any fires on Contract Area or along roads used by Contractor. Contractor's employees shall report all fires as soon as possible to any of the following Forest Service facilities and/or personnel listed below, but not necessarily in the order shown:

	Name	Office Address	Office Telephone
Dispatch Center	FICC	602 S Tippecanoe Ave, San Bernardino, CA 92408	909-383-5654 or 53,52,51
Nearest FS Station	Station 36	23525 Hillview Rd San Bernardino, CA 92404	909-886-1510
Inspector	TBD	N/A	N/A
District Ranger	Michael Nobles	1209 Lytle Creek Rd Lytle Creek, CA 92358	909-382-2851

When reporting a fire, provide the following information:

- Your Name
- Call back telephone number
- Project Name
- Location: Legal description (Township, Range, Section); and Descriptive location (Reference point)
- Fire Information: Including Acres, Rate of Spread and Wind Conditions.

j. Fire Patrolperson: Contractor shall furnish a qualified fire patrolperson each operating day when Project Activity Level C or higher is in effect. When on duty, sole responsibility of patrolperson shall be to patrol the operation for prevention and detection of fires, take suppression action where necessary and notify the Forest Service as required. This Fire patrol is required on foot, unless otherwise agreed. By agreement, one patrolperson may provide patrol on this and adjacent projects. No patrolperson shall be required on Specified Road construction jobs except during clearing operations unless otherwise specified.

The Contractor shall, prior to commencing work, furnish the following information relating to key personnel:

Title	Name	Telephone Number
Fire Supervisor	TBD; Daniel Diaz (Interim)	909-659-4596
Fire Patrolperson	Humberto Ramos	909-361-2384

k. Clearing of Fuels: Contractor shall clear away, and keep clear fuels and logging debris as follows:

Welding equipment and stationary log loaders, yarders and other equipment listed in California State Law	10 feet slope radius
Tail or corner haulback blocks	All running blocks shall be located in the center of an area cleared to mineral soil at least 15 feet in diameter.
Lines near, between or above blocks	Sufficient clearing to prevent line from rubbing on snags, down logs and other dead woody material.

6. EMERGENCY PRECAUTIONS

Contractor's Operations shall conform to the limitations or requirements in the Project Activity Level (PAL) table below. PALs applicable to this project shall be the predicted activity levels for the Fire Danger Rating Area(s), or fire weather station(s) stated in the Contract Area Map Legend on Integrated Resource Service Contracts (IRSC's), and other contracts where applicable.

Fire Danger Rating Area/Fire Weather Station for Project: 660

The Forest Service, in its sole discretion, may change the predicted activity level if the current fire suppression situation, weather, or vegetation conditions warrant an adjustment. If practicable, Forest Service will determine the following day's activity level by 6:00 PM. Contractor shall obtain the predicted Project Activity Level from the appropriate Ranger District Office before starting work each day.

Phone Number or Website to obtain Predicted Activity Levels: 909-382-2997

Forest Service may change the PAL Table to other values upon revision of the National Fire Danger Rating System. When Contractor is notified, the revised PALs will supersede the levels in the table below.

PROJECT ACTIVITY LEVEL

Level	*Project Activity Minimum Requirements and Restrictions. Restrictions at each level are cumulative.*
A	Minimum requirements noted above in Sections 4 and 5.
B	1. Tank truck, trailer, or approved CAFS substitute shall be on or adjacent to the Active Landing.
C	1. When Hot Saws or Masticators are operating, a tank truck, trailer, or approved CAFS substitute shall be within ¼ mile of these operations. Effective communications shall exist between the operator and the Active Landing. 2. Immediately after Mechanical Operations cease, Fire patrol is required for two hours.
D	1. Immediately after Hot Saw or Masticator operations cease, Fire patrol is required for three hours. 2. No Dead Tree felling after 1:00 PM, except recently dead. 3 No burning, blasting, welding, or cutting of metal after 1:00 PM, except by special permit.
Ev	1. The following activities may operate all day: a) Loading and hauling logs decked at approved landings. b) Loading and hauling chips stockpiled at approved landings. c) Servicing equipment at approved sites. d) Dust abatement, road maintenance (Chainsaw use prohibited), culvert installation within cleared area, chip sealing, paving, earth moving or rock aggregate stock pile loading and installation (does not include pit or quarry development). e) Chainsaw and log processing operations associated with loading logs or other forest products at approved landings. 2. Hot Saws or Masticators may operate until 1:00 PM; provided that: a) A tractor or other equipment with a blade capable of constructing fireline is on or adjacent to the active landing or within ¼ mile of the operating equipment. This piece of equipment shall have effective communication with the Hot Saw or Masticator. b) Any additional restrictions specified by the Forest. 3. All other conventional Mechanical Operations are permitted until 1:00 PM. 4. Some operations may be permitted after 1:00 PM, on a case-by-case basis, under the terms of a PAL Ev Variance Agreement. Activities for which a Variance may be issued are: • Rubber Tire Skidding • Chipping on Landings • Helicopter Yarding • Fire Salvage When approved by a Line Officer, a Variance Agreement can be implemented when the criteria specified in the agreement are met and mitigation measures are in place. This approval is good for ten (10) days unless cancelled sooner or extended by the Contracting Officer for an additional ten (10) days. Variance approval can be withdrawn at the sole discretion of the Forest Service. Variance approval is contingent on the 7-day fire weather forecast, fuel conditions, site characteristics, current fire situation, state of Contractor's equipment for prevention and suppression readiness, type of operation and social and community considerations etc. (see attached Project Activity Level Variance Agreement).

Level	***Project Activity Minimum Requirements and Restrictions. Restrictions at each level are cumulative.***
E	The following activities may operate all day: 1. Loading and hauling logs decked at approved landings. 2. Loading and hauling chips stockpiled at approved landings. 3. Servicing Equipment at approved sites. 4. Dust abatement, road maintenance (chainsaw use prohibited) or loading stock piles and rock aggregate installation (does not include pit or quarry development). 5. Chainsaw operation associated with loading at approved landings. All other activities are prohibited.

This Project utilizes PAL, an industrial operation's fire precaution system. The following Climatology Chart indicates the Historic Activity Levels for the Project Fire Danger Rating Area or Fire Weather Station utilized on this Project. This is only a historical average of the Activity Levels for the identified Fire Danger Rating Area or Weather Station.

7. CONTROLING AND EXTINGUISHING FIRES

a. Permittee Duties

i. Prior to commencing work, ensure that verbal communication can be received in an emergency through either a cellular phone or radio system.

ii. Prior to commencing work, ensure employees are provided with the proper safety and fire extinguishing equipment to be prepared in a state of emergency.

iii. Permittee's employees, contractors, and subcontractors are not designated firefighting personnel and are authorized only to fight fire at the immediate outbreak, to the extent that the outbreak may be contained by use of on-site fire extinguishers and hand tools.

iv. Permittee's employees, contractors, and subcontractors shall be trained in the use of fire extinguishers and the use of hand tools to extinguish small fire outbreaks.

v. Permittee's employees shall follow instructions given by emergency crews at the time of a fire.

vi. Precautionary measures shall be taken to avoid and control the risk of fires, as stated in Section 4.

APPENDIX C

Safety Data Sheets

SAFETY DATA SHEET

Automotive Diesel Fuel

Section 1. Identification

GHS product identifier Automotive Diesel Fuel

Other means of identification Truck diesel, G10, BP 10 ppm diesel fuel, Ultra Low Sulphur diesel fuel, Automotive Diesel fuel, AD20, AD40, Alpine Diesel and Biodiesel up to B5.

Product code 0000002718

SDS no. 0000002718

Historic SDS no. AD0K1

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Fuel for compression ignition diesel engines.

Manufacturer

Supplier

BP Australia Pty Ltd
Level 17, 717 Bourke Street
Docklands, Victoria 3008
ABN 53 004 085 616

www.bp.com.au

Technical Helpline Number: 1300 139 700

EMERGENCY TELEPHONE NUMBER 1800 638 556

Section 2. Hazard(s) identification

Classification of the substance or mixture

FLAMMABLE LIQUIDS - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN CORROSION/IRRITATION - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
ASPIRATION HAZARD - Category 1

GHS label elements

Hazard pictograms

Signal word DANGER

Hazard statements

H227 - Combustible liquid.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure. (bone marrow, liver, thymus)

Precautionary statements

General

P102 - Keep out of reach of children.
P101 - If medical advice is needed, have product container or label at hand.

Section 2. Hazard(s) identification

Prevention

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P281 - Use personal protective equipment as required.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P210 - Keep away from flames and hot surfaces. No smoking.
P271 - Use only outdoors or in a well-ventilated area.
P260 - Do not breathe vapour or spray.
P264 - Wash hands thoroughly after handling.

Response

P308 + P313 - IF exposed or concerned: Get medical attention.
P304 + P340, P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.
P301 + P310, P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
P362 - Take off contaminated clothing and wash before reuse.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 - If skin irritation occurs: Get medical attention.

Storage

P405 - Store locked up.
P403 + P235 - Store in a well-ventilated place. Keep cool.

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Not applicable.

Other hazards which do not result in classification

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapour may cause flash fire or explosion.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition and ingredient information

Substance/mixture Mixture

May contain Fatty Acid Methyl Esters (FAME). May also contain small quantities of proprietary performance additives. Contains small quantities of polycyclic aromatic hydrocarbons (PAHs).

Ingredient name	% (w/w)	CAS number
Fuels, diesel	≥75	68334-30-5
Alkanes, C10-20-branched and linear	≤20	928771-01-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Inhalation

If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention.

Section 4. First aid measures

Skin contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Drench contaminated clothing with water before removing. This is necessary to avoid the risk of sparks from static electricity that could ignite contaminated clothing. Contaminated clothing is a fire hazard. Contaminated leather, particularly footwear, must be discarded. Clean shoes thoroughly before reuse. Get medical attention.

Ingestion

Do not induce vomiting. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Aspiration hazard if swallowed. Can enter lungs and cause damage. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects. Product can be aspirated on swallowing or following regurgitation of stomach contents, and can cause severe and potentially fatal chemical pneumonitis, which will require urgent treatment. Because of the risk of aspiration, induction of vomiting and gastric lavage should be avoided. Gastric lavage should be undertaken only after endotracheal intubation. Monitor for cardiac dysrhythmias.

Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis.
Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

Specific treatments

No specific treatment.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet.

Specific hazards arising from the chemical

Combustible liquid. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. Vapours can form explosive mixtures with air. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly-grounded containers. Static accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Liquid will float and may reignite on surface of water.

Section 5. Firefighting measures

Hazardous thermal decomposition products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Special protective actions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling. Eliminate all ignition sources.

For emergency responders

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal.

Methods and material for containment and cleaning up

Small spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres.

Large spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilt product. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not swallow. Aspiration hazard if swallowed. Can enter lungs and cause damage. Never siphon by mouth. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container. Avoid contact of spilt material and runoff with soil and surface waterways. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Restrict flow velocity according to API 2003 (2008), NFPA 77 (2007), and Laurence Britton, “Avoiding Static Ignition Hazards in Chemical Operations”. To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks. Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapour mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurised fuel pipes, the vapour or mists generated will create a flammability or explosion hazard. Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Fuels, diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (measured as total hydrocarbons) 8 hours. Issued/Revised: 1/2007 Form: Inhalable fraction and vapor

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Chemical splash goggles.

Skin protection

Hand protection

Wear chemical resistant gloves. Recommended: Nitrile gloves.

Do not re-use gloves. Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture). Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis. The frequency of replacement will depend upon the circumstances of use.

Skin protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Wear suitable protective clothing.
Footwear highly resistant to chemicals.
When there is a risk of ignition wear inherently fire resistant protective clothes and gloves.
When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and

Section 8. Exposure controls and personal protection

gloves should all be anti-static.
When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.
Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Use with adequate ventilation.
If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.
The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product.

Recommended: If ventilation is inadequate, use respirator that will protect against organic vapour and dust/mist.

Refer to standards:

Respiratory protection:AS/NZS 1715 and AS/NZS 1716
Gloves:AS/NZS 2161.1
Eye protection:AS/NZS 1336 and AS/NZS 1337

Section 9. Physical and chemical properties

Appearance

Physical state Liquid.

Colour Water white to straw including fluorescent green, blue or yellow.

Odour Mild

Odour threshold 0.7 ppm (Based on Fuels, diesel)

pH Not applicable. Based on Solubility in Water (Very slightly soluble in water)

Melting point -29 to -18°C (-20.2 to -0.4°F) (Based on Fuels, diesel)

Boiling point 180 to 380°C (356 to 716°F)

Flash point Closed cup: >61.5°C (>142.7°F) [Pensky-Martens.]

Evaporation rate Not relevant/applicable due to nature of the product. Based on low volatility

Flammability (solid, gas) Not applicable. Based on - Physical state

Lower and upper explosive (flammable) limits Lower: 0.5%
Upper: 7.5%

Vapour pressure 0.1 kPa (0.755 mm Hg) (Based on Concawe Category: Vacuum Gas Oils, Hydrocracked Gas Oils & Distillate Fuels (VHGO))

Vapour density >1 [Air = 1]

Relative density 0.83

Density 820 to 850 kg/m³ (0.82 to 0.85 g/cm³) at 15°C

Solubility Very slightly soluble in water

Partition coefficient: n-octanol/water Not applicable. Based on Fuels, diesel - Substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.

Auto-ignition temperature 240°C (464°F) (Based on Fuels, diesel)

Decomposition temperature Not observed to decompose by final boiling point: 380°C (716°F)

Viscosity Kinematic: 2 to 4.5 mm^2/s (2 to 4.5 cSt) at 40°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.
Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuels, diesel	LC50 Inhalation Dusts and mists	Rat	4.1 mg/l	4 hours
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Oral	Rat	17900 mg/kg	-
	LD50 Oral	Rat	7600 mg/kg	-

Conclusion/Summary Harmful if inhaled.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Fuels, diesel	Skin - Irritation	Rabbit	-	-	-
	Skin - Irritation	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-

Skin Causes skin irritation.

Eyes Not classified. Based on available data, the classification criteria are not met.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
Fuels, diesel	skin	Guinea pig	Not sensitising
	skin	Guinea pig	Not sensitising

Skin Not classified. Based on available data, the classification criteria are not met.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Fuels, diesel	OECD 471	Experiment: In vitro Subject: Non-mammalian species	Positive
	Equivalent to OECD 476	Experiment: In vitro Subject: Mammalian-Animal Cell: Germ	Negative
	not guideline	Experiment: In vivo Subject: Unspecified Cell: Somatic	Negative

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure

Section 11. Toxicological information

Fuels, diesel	Positive - Dermal - Unspecified	Mouse	-	2 years

Conclusion/Summary Suspected of causing cancer.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Developmental toxin	Species	Dose	Exposure
Fuels, diesel	-	-	Negative	Rat	Dermal	20 days
	-	-	Negative	Rat	Dermal	10 days
	-	-	Negative	Rat	Dermal	10 days

Conclusion/Summary Development: Not classified. Based on available data, the classification criteria are not met.
Fertility: Not classified. Based on available data, the classification criteria are not met.
Effects on or via lactation: Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Fuels, diesel	Category 2	-	bone marrow, liver, thymus

Aspiration hazard

Name	Result
Fuels, diesel	ASPIRATION HAZARD - Category 1
Alkanes, C10-20-branched and linear	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Inhalation Harmful if inhaled.

Skin contact Causes skin irritation.

Ingestion Irritating to mouth, throat and stomach. Aspiration hazard if swallowed -- harmful or fatal if liquid is aspirated into lungs.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact Adverse symptoms may include the following:
irritation
redness

Ingestion Adverse symptoms may include the following:
nausea or vomiting

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Section 11. Toxicological information

Eye contact Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Inhalation Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Skin contact As with all such products containing potentially harmful levels of polycyclic aromatic hydrocarbons, prolonged or repeated skin contact may eventually result in dermatitis or more serious irreversible skin disorders including cancer.

Ingestion If swallowed, may irritate the mouth, throat and digestive system. If swallowed, may cause abdominal pain, stomach cramps, nausea, vomiting, diarrhoea, dizziness and drowsiness.

General May cause damage to organs through prolonged or repeated exposure. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer.

Carcinogenicity Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (dusts and mists)	4.1 mg/l

Other information Diesel exhaust particulates have been classified by the National Toxicological Program (NTP) to be a reasonably anticipated human carcinogen. Exposure should be minimized to reduce potential risk.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Fuels, diesel	EL50 >1000 mg/l Nominal Fresh water	Micro-organism	40 hours
	NOELR 3.217 mg/l Nominal Fresh water	Micro-organism	40 hours
	Acute EL50 22 mg/l Nominal Fresh water	Algae	72 hours
	Acute EL50 210 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute EL50 68 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute ErL50 78 mg/l Nominal Fresh water	Algae	72 hours
	Acute LL50 65 mg/l Nominal Fresh water	Fish	96 hours
	Acute LL50 21 mg/l Nominal Fresh water	Fish	96 hours
	Acute NOELR 10 mg/l Nominal Fresh water	Algae	72 hours
	Acute NOELR 1 mg/l Nominal Fresh water	Algae	72 hours

Section 12. Ecological information

	Acute NOELR 46 mg/l Nominal Fresh water	Daphnia	48 hours
	Chronic NOEL 0.083 mg/l Nominal Fresh water	Fish	14 days
	Chronic NOELR 0.2 mg/l Nominal Fresh water	Daphnia	21 days

Conclusion/Summary Toxic to aquatic life with long lasting effects.

Persistence and degradability

Expected to be biodegradable.

Product/ingredient name	Test	Result	Dose	Inoculum
Fuels, diesel	OECD 301 F	60 % - Readily - 28 days	30 mg/l	-
	OECD 301 F	57.5 % - Not readily - 28 days	25 mg/l	-
	Equivalent to EPA OTS 796.3100	35 % - Not readily - 28 days	5 mg/l	-

Conclusion/Summary Persistent per IMO criteria

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination. This material may accumulate in sediments.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Special Precautions for Landfill or Incineration Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

Section 14. Transport information

	ADG	IMDG	IATA
UN number	Not regulated.	UN3082	UN3082
UN proper shipping name	-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.. Marine pollutant (Fuels, diesel)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Fuels, diesel)
Transport hazard class(es)	-	9 	9 
Packing group	-	III	III
Environmental hazards	No.	Yes.	Yes.
Additional information	**Remarks** Combustible liquid Class C1 (AS 1940).	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. **Emergency schedules** F-A, S-F	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Special precautions for user Not available.

Transport in bulk according to IMO instruments **Proper shipping name** MARPOL Annex 1 rules apply for bulk shipments by sea.
Category: gas oils, including ship's bunkers

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

Not scheduled

Consumer products - This product is exempt per Appendix A of the SUSMP.
Industrial Products - Labelling requirements for SUSMP do not apply to a poison that is packed and sold solely for industrial, laboratory or manufacturing use. However, this product is labelled in accordance with NOSHC National Code of Practice for labelling of workplace substances.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Montreal Protocol

Ingredient name	List name	Status
Not listed.		

Stockholm Convention on Persistent Organic Pollutants

Ingredient name	List name	Status
Not listed.		

Rotterdam Convention on Prior Informed Consent (PIC)

Section 15. Regulatory information

Ingredient name	List name	Status
Not listed.		

International lists

National inventory

REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.
Australia inventory (AICS)	Contact local supplier or distributor.
Canada inventory	Not determined.
China inventory (IECSC)	Not determined.
Japan inventory (ENCS)	Not determined.
Korea inventory (KECI)	Not determined.
Philippines inventory (PICCS)	Not determined.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
United States inventory (TSCA 8b)	Not determined.

Section 16. Any other relevant information

History

Date of printing	5/14/2021
Date of issue/Date of revision	5/14/2021
Date of previous issue	8/6/2019
Version	4
Prepared by	Product Stewardship

Key to abbreviations

ADG = Australian Dangerous Goods
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
NOHSC = National Occupational Health and Safety Commission
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
STEL = Short term exposure limit
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations
TWA = Time weighted average
VOC = Volatile Organic Compound
SADT = Self-Accelerating Decomposition Temperature
Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Procedure used to derive the classification

Section 16. Any other relevant information

Classification	Justification
FLAMMABLE LIQUIDS - Category 4	On basis of test data
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
SKIN CORROSION/IRRITATION - Category 2	Calculation method
CARCINOGENICITY - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2	Calculation method
ASPIRATION HAZARD - Category 1	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Safety Data Sheet

SECTION 1 CHEMICAL IDENTIFIER AND COMPANY IDENTIFICATION

Chevron and Texaco Unleaded Gasolines (All Grades)

Recommended Use of the Chemical and Restrictions on Use: Fuel
Synonyms: Automotive; Calco Mid-Grade Unleaded Gasoline; Calco Premium Gasoline; Calco Regular Unleaded Gasoline; CHEVRON and TEXACO MID-GRADE UNLEADED GASOLINES; CHEVRON and TEXACO PREMIUM UNLEADED GASOLINES; CHEVRON and TEXACO REGULAR UNLEADED GASOLINES; Chevron Mid-Grade Unleaded Gasoline; Chevron Plus Unleaded Gasoline; Chevron Premium Unleaded Gasoline; Chevron Regular Unleaded Gasoline; Chevron Supreme Plus Unleaded Gasoline; Chevron Supreme Unleaded Gasoline; Chevron UL/CQ Gasoline; GASOLINE (GENERIC); Gasolines; Texaco Power Plus Gasoline; Texaco Power Premium Unleaded Gasoline; Texaco Unleaded Gasoline; UNLEADED GASOLINE FOR EXPORT
Company Identification
Chevron Products Company
5001 Executive Parkway, Suite 200
San Ramon, CA 94583
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency & Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Product Information: (800) 582-3835
SDS Requests: lubemsds@chevron.com

SPECIAL NOTES: This SDS applies to: all motor gasoline.

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION:
- Flammable liquid: Category 1.
- Aspiration toxicant: Category 1.
- Carcinogen: Category 1B.
- Eye irritation: Category 2A.
- Germ Cell Mutagen: Category 1B.
- Reproductive toxicant (developmental): Category 2.
- Skin irritation: Category 2.
- Target organ toxicant (central nervous system): Category 3.
- Target organ toxicant (repeated exposure): Category 2.
- Acute aquatic toxicant: Category 2.
- Chronic aquatic toxicant: Category 2.

Signal Word: Danger
Physical Hazards:
- Extremely flammable liquid and vapour (H224).

Health Hazards:
- May be fatal if swallowed and enters airways (H304).
- Causes skin irritation (H315).
- Causes serious eye irritation (H319).
- May cause drowsiness or dizziness (H336).
- May cause genetic defects (H340).
- May cause cancer (H350).
- Suspected of damaging the unborn child (H361D).
- May cause damage to organs (Blood/Blood Forming Organs) through prolonged or repeated exposure (H373).

Environmental Hazards:
- Toxic to aquatic life with long lasting effects (H411).

PRECAUTIONARY STATEMENTS:
General:
- Keep out of reach of children (P102).
- Read label before use (P103).

Prevention:
- Obtain special instructions before use (P201).
- Do not handle until all safety precautions have been read and understood (P202).
- Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking (P210).
- Keep container tightly closed (P233).
- Keep cool (P235).
- Ground and bond container and receiving equipment (P240).
- Use explosion-proof electrical/ventilating/lighting/equipment (P241).
- Use non-sparking tools (P242).
- Take action to prevent static discharge (P243).
- Do not breathe dust/fume/gas/mist/vapours/spray (P260).
- Wash thoroughly after handling (P264).
- Use only outdoors or in a well-ventilated area (P271).
- Avoid release to the environment (P273).
- Wear protective gloves/protective clothing/eye protection/face protection (P280).

Response:
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician (P301+P310).
- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower (P303+P361+P353).
- IF INHALED: Remove person to fresh air and keep comfortable for breathing (P304+P340).
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing (P305+P351+P338).
- IF exposed or concerned: Get medical advice/attention (P308+P313).
- Specific treatment (see Notes to Physician on this label) (P321).
- Do NOT induce vomiting (P331).
- If skin irritation occurs: Get medical advice/attention (P332+P313).

- If eye irritation persists: Get medical advice/attention (P337+P313).
- Wash contaminated clothing before reuse (P363).
- In case of fire: Use media specified in the SDS to extinguish (P370+P378).
- Collect spillage (P391).

Storage:

- Store in a well-ventilated place. Keep container tightly closed (P403+P233).
- Store locked up (P405).

Disposal:

- Dispose of contents/container in accordance with applicable local/regional/national/international regulations (P501).

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

This material is a mixture.

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %volume
Toluene	108-88-3	1 - 35 %volume
Pentane, 2,2,4-trimethyl-	540-84-1	10 - 15 %volume
Xylene	1330-20-7	1 - 15 %volume
Trimethylbenzene (3 isomers: 1,2,3-; 1,2,4-; 1,3,5-isomer)	25551-13-7	5 - 10 %volume
Pentane isomers (pentanes)	Mixture	1 - 13 %volume
Butane	106-97-8	1 - 12 %volume
Ethanol	64-17-5	0 - 10 %volume
Hexane	110-54-3	1 - 5 %volume
Benzene	71-43-2	0.1 - 5 %volume
Heptane	142-82-5	1 - 4 %volume
Cyclohexane	110-82-7	1 - 3 %volume
Ethylbenzene	100-41-4	0.1 - 3 %volume
Methylcyclohexane	108-87-2	1 - 2 %volume
Naphthalene	91-20-3	0.1 - 2 %volume

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Dry Chemical, CO2, Aqueous Film Forming Foam (AFFF) or alcohol resistant foam.
Unusual Fire Hazards: See Section 7 for proper handling and storage.
UNSUITABLE EXTINGUISHING MEDIA: No data available

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures:
Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Environmental Precautions:
Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater.
Methods and Material For Containment and Cleaning Up:
Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting:
Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE PRECAUTIONS

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.
Do not store in open or unlabeled containers. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any other such use. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty

container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment (PPE). If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, refer to PPE information below.

Factors that affect PPE include, but are not limited to: properties of the chemical, other chemicals which may contact the same PPE, physical requirements (fit & sizing, cut/puncture protection, dexterity, thermal protection, etc.), and potential allergic reactions to the PPE material. It is the responsibility of the user to read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use general ventilation, local exhaust ventilation, or a combination of both.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear chemical personal protective equipment (PPE) to prevent skin contact. Selection of chemical protective clothing should be performed by an Occupational Hygienist or Safety Professional and be based upon applicable standards (ASTM F739 or EN 374). Using chemical PPE depends upon operations conducted and may include chemical gloves, boots, chemical apron, chemical suit, and complete facial protection. Refer to PPE manufacturers to obtain breakthrough time information to determine how long PPE can be used before it needs to be replaced. Unless specific glove manufacturer data indicates otherwise, the below table is based upon available industry data to assist in the glove selection process and is intended to be used as reference only.

Chemical Glove Material	Thickness (mm)	Typical Breakthrough Time (minutes)
Butyl	0.7	7
Neoprene	0.61	7
Nitrile	0.8	60
Nitrile	0.23	2
Polyvinyl Chloride (PVC)	1.1	2
Viton Butyl	0.3	120

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors. When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon

monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Country/ Agency	Form	TWA	STEL	Ceiling	Notation
Gasoline	ACGIH	Vapor	300 ppm	500 ppm	--	A3
Gasoline	ACGIH	--	300 ppm	500 ppm	--	--
Toluene	ACGIH	--	20 ppm	--	--	--
Toluene	JSOH	--	188 mg/m3	--	--	Skin
Pentane, 2,2,4-trimethyl-	ACGIH	--	300 ppm	--	--	--
Pentane, 2,2,4-trimethyl-	JSOH	--	1400 mg/m3	--	--	--
Xylene	ACGIH	--	20 ppm	--	--	--
Xylene	JSOH	--	217 mg/m3	--	--	--
Trimethylbenzene (3 isomers: 1,2,3-; 1,2,4-; 1,3,5- isomer)	ACGIH	--	10 ppm	--	--	--
Butane	ACGIH	--	--	1000 ppm	--	--
Butane	JSOH	--	1200 mg/m3	--	--	--
Ethanol	ACGIH	--	1000 ppm	1000 ppm	--	A4
Hexane	ACGIH	--	50 ppm	--	--	Skin
Hexane	JSOH	--	140 mg/m3	--	--	Skin
Benzene	ACGIH	Vapor	0.50 ppm	2.50 ppm	--	--
Benzene	ACGIH	--	0.05 ppm	2.50 ppm	--	Skin
Benzene	CVX	Vapor	0.50 ppm	2.50 ppm	--	--
Heptane	ACGIH	--	400 ppm	500 ppm	--	--
Heptane	JSOH	--	820 mg/m3	--	--	--
Cyclohexane	ACGIH	--	100 ppm	--	--	--
Cyclohexane	JSOH	--	520 mg/m3	--	--	--
Ethylbenzene	ACGIH	Vapor	100 ppm	--	--	--
Ethylbenzene	ACGIH	--	20 ppm	--	--	--
Ethylbenzene	JSOH	--	87 mg/m3	--	--	Skin
Methylcyclohexane	ACGIH	--	400 ppm	--	--	--
Methylcyclohexane	JSOH	--	1600 mg/m3	--	--	--
Naphthalene	ACGIH	Vapor	10 ppm	15 ppm	--	A4 Skin
Naphthalene	ACGIH	--	10 ppm	--	--	Skin

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: 5 psi - 15.50 psi (Typical) @ 37.8 °C (100 °F)
Relative Vapor Density: 3 - 4 (Typical)
Particle Characteristics: No data available
Boiling Point: 27.2°C (81°F) - 52.8°C (127°F) (Typical)

Solubility: Negligible
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.70 g/ml - 0.80 g/ml @ 15.6°C (60.1°F) (Typical)
Density: No data available
Viscosity: <1 SUS @ 37.8°C (100°F)
Evaporation Rate: No data available
n-Octanol/Water Partition Coefficient: 2 - 7
Combustion Characteristics (Solids/Gases): No data available
Decomposition Temperature: No data available
Boiling Range: No data available

FLAMMABLE PROPERTIES:
Flashpoint: (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)

Autoignition: > 280 °C (> 536 °F)
Flammability (solid, gas): Not Applicable
Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 HAZARD INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye: Contact with the eyes causes severe irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.
Eye Irritation: This material causes serious eye irritation. The product has not been tested. The statement is based on evaluation of data for product components.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response.
Acute Dermal Toxicity: LD50: >3.75 g/kg (rabbit).
Skin Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.
Skin Sensitization: This material did not cause skin sensitization reactions in a Buehler guinea pig test.

Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Acute Oral Toxicity: LD50: >5 ml/kg (rat).

Inhalation: Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of

consciousness, coma or death.
Acute Inhalation Toxicity: 4 hour(s) LD50: >20000 mg/m3 (rat).
Acute Toxicity Estimate: Not Determined

DELAYED OR OTHER HEALTH EFFECTS:
Reproductive Toxicity: Contains material that may cause harm to the unborn child if inhaled above the recommended exposure limit. This material is suspected of damaging the unborn child. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Carcinogenicity: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
This material may cause cancer. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Germ Cell Mutagenicity: This material may cause genetic defects. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated inhalation at concentrations above the recommended exposure limit: Blood/Blood Forming Organs
Specific Target Organ Toxicity - Single Exposure: This material may cause drowsiness or dizziness. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Specific Target Organ Toxicity - Repeated Exposure: This material may cause damage to organs through prolonged or repeated exposure. The product has not been tested. The statement is based on evaluation of data for similar materials or product components.
Aspiration Hazard: This material is considered an aspiration hazard based on the kinematic viscosity of the material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains naphthalene.
GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts.
REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30,

and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day.

This product contains cyclohexane.
Cyclohexane primarily affects the central nervous systems of laboratory animals and humans. Acute or prolonged inhalation of cyclohexane at levels below the recommended exposure limits does not result in toxic effects while acute exposures to levels above these recommended limits can cause reversible central nervous system depression. Prolonged exposures of laboratory animals to high levels (up to low thousands of parts per million) have also caused reversible effects which included hyperactivity, diminished response to stimuli, and adaptive liver changes while very high levels (high thousands of parts per million) were fatal. No developmental effects were seen in rats or rabbits following exposures of up to 7000 ppm cyclohexane. No reproductive effects occurred in rats, although postnatal pup growth was reduced at 7000 ppm in a similar manner as observed in the parental animals. Cyclohexane has not been shown to be mutagenic in several in vitro and in vivo assays and has not produced tumors in several dermal application long-term bioassays. Based on these results and the lack of any mutagenic or genotoxic metabolites, cyclohexane is not expected to be mutagenic or genotoxic. Following dermal exposure, cyclohexane is rapidly absorbed, metabolized,and excreted.

This product contains butane.
An atmospheric concentration of 100,000 ppm (10%) butane is not noticeably irritating to the eyes, nose or respiratory tract, but will produce slight dizziness in a few minutes of exposure. No chronic systemic effect has been reported from occupational exposure.

This product contains benzene.
GENETIC TOXICITY/CANCER: Repeated or prolonged breathing of benzene vapor has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. In some individuals, benzene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation.
REPRODUCTIVE/DEVELOPMENTAL TOXICITY: No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.
OCCUPATIONAL: The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product.

This product contains n-hexane.
TARGET ORGAN TOXICITY: Prolonged or repeated ingestion, skin contact or breathing of vapors of n-hexane has been shown to cause peripheral neuropathy. Recovery ranges from no recovery to complete recovery depending upon the severity of the nerve damage. Exposure to 1000 ppm n-hexane for 18 hr/day for 61 days has been shown to cause testicular damage in rats. However, when rats were exposed to higher concentrations for shorter daily periods (10,000 ppm for 6 h/day, 5 days/wk for 13 weeks), no testicular lesions were seen.
CARCINOGENICITY: Chronic exposure to commercial hexane (52% n-hexane) at a concentration of 9000ppm was not carcinogenic to rats or to male mice, but did result in an increased incidence of liver tumors in female mice. No carcinogenic effects were observed in female mice exposed to 900 or 3000 ppm hexane or in male mice. The relevance for humans of these hexane-induced mouse liver tumors is questionable.
GENETIC TOXICITY: n-Hexane caused chromosome aberrations in bone marrow of rats, but was

negative in the AMES and mouse lymphoma tests.

This product contains ethanol (ethyl alcohol).
Chronic ingestion of ethanol can damage the liver, nervous system and heart. Chronic heavy consumption of alcoholic beverages has been associated with an increased risk of cancer. Ingestion of ethanol during pregnancy can cause human birth defects such as fetal alcohol syndrome.

Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2/3, 8 and 15 of this SDS. More detailed information on the health hazards of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).

Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The actual evidence for carcinogenicity in humans was considered inadequate.

MUTAGENICITY: Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chomosomal aberrations in their bone marrow cells. EPIDEMIOLOGY: To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

This product contains ethylbenzene.
BIRTH DEFECTS AND REPRODUCTION: Ethylbenzene is not expected to cause birth defects or other developmental effects based on well-conducted studies in rabbits and rats sponsored by NIOSH. Other studies in rats and mice which reported urinary tract malformations have many deficiencies and have limited usefulness in evaluating human risk. Reproductive effects are not expected based on a NIOSH study of fertility, and lack of effects observed for sperm counts and motility, estrous cycle and pathology of reproductive organs following repeated exposures. HEARING: Statistically significant losses in outer hair cells (OHCs) were observed in rats exposed to >=200 ppm ethylbenzene, 6 hours/day, 6 days/week for 13 weeks, after an 8-week recovery period. Following longer exposure, inner hair cells losses were also observed in rats exposed to >= 600 ppm ethylbenzene, but only occasionally in rats exposed to 400 ppm. The Lowest Observed Adverse Effect Level in rats (LOAEL) was 200 ppm for losses of OHCs. Guinea pigs exposed to ethylbenzene at 2,500 ppm, 6 hours/day for 5 days did not show auditory deficits or losses in OHCs. The concentration of ethylbenzene used in the JP-8 study was approximately 10 ppm. GENETIC TOXICITY: Ethylbenzene tested negative in the bacterial mutation test, Chinese Hamster Ovary (CHO) cell in vitro assay, sister chromatid exchange assay and an unscheduled DNA synthesis assay. Conflicting results have been reported for the mouse lymphoma cell assay. Increased micronuclei were reported in an in vitro Syrian hamster embryo cell assay; however, two in vivo micronuclei studies in mice were negative. In Syrian hamster embryo cells in vitro, cell transformation was observed at 7 days of incubation but not at 24 hours. Based on these results, ethylbenzene is not expected to be mutagenic or clastogenic. CARCINOGENICITY: In studies conducted by the National Toxicology Program, rats and mice were exposed to ethylbenzene at 25, 250 and 750 ppm for six hours per day, five days per week for 103 weeks. In rats exposed to 750 ppm, the incidence of kidney tubule hyperplasia and tumors was increased. Testicular tumors develop spontaneously in nearly all rats if allowed to complete their natural life span; in this study, the development of these tumors appeared to be enhanced in male rats exposed to 750 ppm. In mice, the incidences of lung tumors in males and liver tumors in females exposed to 750 ppm were increased as compared to control mice but were within the range of incidences observed historically in control mice. Other liver effects were observed in male mice exposed to 250 and 750 ppm. The incidences of hyperplasia were increased in the pituitary gland in female mice at 250 and 750 ppm and in the thyroid in male and female mice at 750 ppm.

This product contains toluene.
GENERAL TOXICITY: The primary effects of exposure to toluene in animals and humans are on the central nervous system. Solvent abusers, who typically inhale high concentrations (thousands of ppm) for brief periods of time, in addition to experiencing respiratory tract irritation, often suffer permanent central nervous system effects that include tremors, staggered gait, impaired speech, hearing and vision loss, and changes in brain tissue. Death in some solvent abusers has been attributed to cardiac arrhythmias, which appear to be have been triggered by epinephrine acting on solvent sensitized cardiac tissue. Although liver and kidney effects have been seen in some solvent abusers, results of animal testing with toluene do not support these as primary target organs.
HEARING: Humans who were occupationally exposed to concentrations of toluene as low as 100 ppm for long periods of time have experienced hearing deficits. Hearing loss, as demonstrated using behavioral and electrophysiological testing as well as by observation of structural damage to cochlear hair cells, occurred in experimental animals exposed to toluene. It also appears that toluene exposure and noise may interact to produce hearing deficits.
COLOR VISION: In a single study of workers exposed to toluene at levels under 50 ppm, small decreases in the ability to discriminate colors in the blue-yellow range have been reported for female workers. This effect, which should be investigated further, is very subtle and would not likely have been noticed by the people tested.
REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Toluene may also cause mental and/or growth retardation in the children of female solvent abusers who directly inhale toluene (usually at thousands of ppm) when they are pregnant. Toluene caused growth retardation in rats and rabbits when administered at doses that were toxic to the mothers. In rats, concentrations of up to 5000 ppm did not cause birth defects. No effects were observed in the offspring at doses that did not intoxicate the pregnant animals. The exposure level at which no effects were seen (No Observed Effect Level, NOEL) is 750 ppm in the

rat and 500 ppm in the rabbit.

This product contains xylene.
ACUTE TOXICITY: The primary effects of exposure to xylene in animals and humans are on the central nervous system. In addition,in some individuals, xylene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation. DEVELOPMENTAL TOXICITY: Xylene has been reported to cause developmental toxicity in rats and mice exposed by inhalation during pregnancy. The effects noted consisted of delayed development and minor skeletal variations. In addition, when pregnant mice were exposed by ingestion to a level that killed nearly one-third of the test group, lethality (resorptions) and malformations (primarily cleft palate) occurred. Since xylene can cross the placenta, it may be appropriate to prevent exposure during pregnancy. GENETIC TOXICITY/CARCINOGENICITY: Xylene was not genotoxic in several mutagenicity testing assays including the Ames test. In a cancer study sponsored by the National Toxicology Program (NTP),technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years. HEARING: Mixed xylenes have been shown to cause measurable hearing loss in rats exposed to 800 ppm in the air for 14 hours per day for six weeks. Exposure to 1450 ppm xylene for 8 hours caused hearing loss while exposure to 1700 ppm for 4 hours did not. Although no information is available for lower concentrations, other chemicals that cause hearing loss in rats at relatively high concentrations do not cause hearing loss in rats at low concentrations. Worker exposure to xylenes at the permissible exposure limit (100 ppm, time-weighted average) is not expected to cause hearing loss.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

48 hour(s) LC50: 3.0 mg/l (Daphnia magna)
96 hour(s) LC50: 1.8 mg/l (Mysidopsis bahia)
96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)
96 hour(s) LC50: 2.7 mg/l (Oncorhynchus mykiss)

MOBILITY IN SOIL
No data available.

PERSISTENCE AND DEGRADABILITY
This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the

weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: 2 - 7

ADVERSE EFFECTS FOR OZONE LAYER:
No data available.

SECTION 13 NOTES ON DISPOSAL

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

UN Shipping Description: UN1203, GASOLINE, 3, II

IMO/IMDG Shipping Description: UN1203, GASOLINE, 3, II, FLASH POINT SEE SECTION 9, MARINE POLLUTANT (GASOLINE)

ICAO/IATA Shipping Description: UN1203, GASOLINE, 3, II

Domestic Regulatory Information
Land Regulatory Information: subject to the provisions of the Fire Service Act
Maritime Regulatory Information: subject to the provisions of the Ship Safety Act
Aviation Regulatory Information: subject to the provisions of the Civil Aeronautics Act

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B
02-1=PRTR (Pollutant Release and Transfer Register) Class 1
02-2=PRTR (Pollutant Release and Transfer Register) Class 2
03-1=Industrial Safety and Health Law (Harmful Substances, etc., Prohibited for Manufacture)
03-2=Industrial Safety and Health Law (Harmful Substances Subject to Obtaining Permission for Manufacturing)
03-3=Industrial Safety and Health Law (Harmful Substances Whose Names, etc., are to Be Indicated)
03-4=Industrial Safety and Health Law (Notifiable Substances)
04-1=Poisonous and Deleterious Substances Control Law (Poisonous substance)
04-2=Poisonous and Deleterious Substances Control Law (Deleterious substance)

The following components of this material are found on the regulatory lists indicated.

Gasoline	01-2B
Toluene	02-1, 03-3, 03-4, 04-2
Pentane, 2,2,4-trimethyl-	02-2, 03-3
Xylene	02-1, 03-3, 03-4, 04-2
Trimethylbenzene (3 isomers: 1,2,3-; 1,2,4-; 1,3,5-isomer)	02-1, 03-3, 03-4
Butane	03-3, 03-4
Ethanol	01-1, 03-3, 03-4
Hexane	02-1, 03-3, 03-4
Benzene	01-1, 02-1, 03-1, 03-3, 03-4
Heptane	02-1, 03-3, 03-4
Cyclohexane	02-1, 03-3, 03-4
Ethylbenzene	01-2B, 02-1, 03-3, 03-4
Methylcyclohexane	03-3, 03-4
Naphthalene	01-1, 01-2B, 02-1, 03-3, 03-4

JAPANESE FIRE LAW: Group 4, Class 1 Petroleum

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AIIC (Australia), DSL (Canada), EINECS (European Union), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: SECTION 08 - Engineering Control Measures information was modified.
SECTION 08 - General Considerations information was modified.
SECTION 08 - Occupational Exposure Limit Table information was modified.
SECTION 08 - Personal Protective Equipment List information was deleted.
SECTION 08 - Personal Protective Equipment information was added.
SECTION 08 - Skin Protection information was modified.
SECTION 15 - Regulatory Information information was modified.

Revision Date: 2023/03/01

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
CVX - Chevron	NFPA - National Fire Protection Association (USA)
	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	

Prepared according to JIS Z 7253:2019 / JIS Z 7252:2019 by Chevron Technical Center, 6001 Bollinger Canyon Road, San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is

furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

NORTH AMERICAN LUBRICANTS

PureSYN Motor Oil (All Grades)
SDS# 5020, Version 1.0
Effective Date 6/05/2020
According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

Safety Data Sheet

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture
Product Name: PureSYN Motor Oil
Product Grades:

PureSYN SAE 0W-16 GF-6B/SP – 1313860119 (300G Tote), 1313860163 (6 Gal Box)

PureSYN SAE 0W-20 GF-6A/SP – 1313100110 (Bulk), 1313100118 (320G Tote), 1313100121 (Tote), 1313100130 (Drum), 1313100163 (6 Gal Box), 1313100172 (6x1Q Case)

PureSYN SAE 0W-20 dexos 1 GF-6A/SP – 1313100210 (Bulk). 1313100220 (330G Tote), 1313100218 (320G Totes), 1313100221 (Tote), 1313100230 (Drum), 1313100263 (6 Gal Box), 1313100271 (12x1Q Case), 1313100272 (6x1Q Case)

PureSYN SAE 5W-20 GF-6A/SP – 1313130110 (Bulk), 1313130120 (330G Tote), 1313130118 (320G Tote), 1313130121 (Tote), 1313130130 (Drum), 1313130163 (6 Gal Box), 1313130171 (12x1Q Case)

PureSYN SAE 5W-30 GF-6A/SP – 1313140110 (Bulk)

PureSYN SAE 5W-30 dexos 1 GF-6A/SP – 1313140210 (Bulk), 1313140220 (330G Tote), 1313140218 (320G Tote), 1313140221 (Tote), 1313140230 (Drum), 1313140263 (6 Gal Box), 1313140271 (12x1Q Case), 1313140272 (6x1Q Case)

PureSYN SAE 10W-30 GF-6A/SP –1316170110 (Bulk), 1316170121 (Tote), 1316170130 (Drum), 1316170163 (6 Gal Box), 1316170171 (12x1Q Case)

PureSYN EURO SAE 5W-40 ACEA A3/B4 - 1313154310 (Bulk), 1313154320 (330G Tote), 1313154318 (320G Tote), 1313154321 (Tote), 1313154363 (6 Gal Bulk Box)

Synonyms: Synthetic Engine Oil

1.2. Intended Use of the Product

Engine Oil.

1.3. Company Identification

North American Lubricants Company
7337 E. Doubletree Ranch Road, Suite 180
Scottsdale, AZ 85258
(800)430-6252
www.nalube.com

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: (800)424-9300 or (703)527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Aquatic Acute 2 H411

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US)	:	Not Classified
Signal Word (GHS-US)	:	None
Hazard Statements (GHS-US)	:	H411 – Toxic to aquatic life with long lasting effects.
Precautionary Statements (GHS-US)	:	**Prevention** P273 - Avoid release to the environment. **Response** P391: Collect Spillage **Storage** None **Disposal** P501 – Dispose of contents/container in accordance with local, regional, national, and international regulations.

2.3. Other Hazards

The mixture consists of substances capable of producing an aspiration hazard. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure, and even death.

2.4. Unknown Acute Toxicity (GHS-US)

20.73 percent of the mixture consists of ingredient(s) of unknown acute toxicity.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
heavy paraffinic, Distillates, petroleum, hydrotreated heavy paraffinic	(CAS No) 64742-54-7	45 – 51, 55 - 67	Asp. Tox. 1, H304
Paraffin oils*	(CAS No) 8012-95-1	0 - 0.1, 0.1- 1, 1 - 5	Asp. Tox. 1, H304 Aquatic Chronic 4, H413
1-Decene, homopolymer, hydrogenated	(CAS No) 68037-01-4	25 – 42, 20 - 30	Asp. Tox. 1, H304
Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts	(CAS No) 68649-42-3	2.7 - 11.75	Skin Irrit. 2, H315 Eye Dam. 1, H318 Aquatic Acute 2, H401 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of

the OSHA Hazard Communication Standard [29 CFR 1910.1200].

*More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary, due to varying composition.

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label if possible).

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Drench affected area with water or soap and water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: No known significant effects or critical hazards.

Inhalation: Overexposure may be irritating to the respiratory system.

Skin Contact: Repeated or prolonged skin contact may cause irritation.

Eye Contact: Direct contact with the eyes is likely irritating.

Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: No known significant effects or critical hazards.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: FIRE FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable but will support combustion.

Explosion Hazard: Product is not explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Under fire conditions, may produce fumes, smoke, oxides of carbon and hydrocarbons.

Other Information: Refer to Section 9 for flammability properties.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing (vapor, mist, spray).

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Eliminate ignition sources. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Spills should be contained with mechanical barriers. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. For further information refer to section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Practice good housekeeping - spillage can be slippery on smooth surface either wet or dry.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Materials: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

Engine Oil .

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Paraffin oils (8012-95-1)		
USA ACGIH	ACGIH TWA (mg/m³)	5 mg/m³ (excluding metal working fluids, highly & severely refined-inhalable fraction)
USA ACGIH	ACGIH chemical category	Not Classifiable as a Human Carcinogen highly and severely refined, Suspected Human Carcinogen highly and severely refined
USA OSHA	OSHA PEL (TWA) (mg/m³)	5 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³)	5 mg/m³
USA NIOSH	NIOSH REL (STEL) (mg/m³)	10 mg/m³
USA IDLH	US IDLH (mg/m³)	2500 mg/m³
Alberta	OEL STEL (mg/m³)	10 mg/m³
Alberta	OEL TWA (mg/m³)	5 mg/m³
British Columbia	OEL TWA (mg/m³)	0.2 mg/m³ (mildly refined) 1 mg/m³ (severely refined)

Manitoba	OEL TWA (mg/m³)	5 mg/m³ (excluding metal working fluids, highly & severely refined-inhalable fraction)
New Brunswick	OEL STEL (mg/m³)	10 mg/m³
New Brunswick	OEL TWA (mg/m³)	5 mg/m³ (as sampled by a method that does not collect vapor)
Newfoundland & Labrador	OEL TWA (mg/m³)	5 mg/m³ (excluding metal working fluids, highly & severely refined-inhalable fraction)
Nova Scotia	OEL TWA (mg/m³)	5 mg/m³ (excluding metal working fluids, highly & severely refined-inhalable fraction)
Nunavut	OEL STEL (mg/m³)	10 mg/m³
Nunavut	OEL TWA (mg/m³)	5 mg/m³
Northwest Territories	OEL STEL (mg/m³)	10 mg/m³
Northwest Territories	OEL TWA (mg/m³)	5 mg/m³
Ontario	OEL TWA (mg/m³)	5 mg/m³ (pure, highly and severely refined, excluding metal working fluids-inhalable)
Prince Edward Island	OEL TWA (mg/m³)	5 mg/m³ (excluding metal working fluids, highly & severely refined-inhalable fraction)
Québec	VECD (mg/m³)	10 mg/m³ (mist)
Québec	VEMP (mg/m³)	5 mg/m³ (mist)
Saskatchewan	OEL STEL (mg/m³)	10 mg/m³
Saskatchewan	OEL TWA (mg/m³)	5 mg/m³
Yukon	OEL STEL (mg/m³)	10 mg/m³
Yukon	OEL TWA (mg/m³)	5 mg/m³

8.2. Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

Personal Protective Equipment: Protective goggles. Gloves. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical goggles or safety glasses.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink or smoke during use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Amber
Odor	:	Slight Hydrocarbon
Odor Threshold	:	Not available
pH	:	Not available
Evaporation Rate	:	Not available
Melting Point	:	Not available
Boiling Point	:	280 °C (536 °F)
Flash Point	:	205 °C (COC) (401 °F)
Auto-ignition Temperature	:	Not available
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	Not available
Upper Flammable Limit	:	Not available
Vapor Pressure	:	Not available
Relative Vapor Density at 20 °C	:	Not available
Relative Density	:	Not available
Specific Gravity	:	0.85
Solubility	:	Negligible
Partition Coefficient: N-Octanol/Water	:	Not available
Viscosity	:	Not available
Viscosity, Kinematic	:	50 mm^2/s @ 40 °C
Explosive Properties	:	Product is not explosive
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge

SECTION 10: STABILITY AND REACTIVITY

10.1. **Reactivity:** Hazardous reactions will not occur under normal conditions.

10.2. **Chemical Stability:** Stable under recommended handling and storage conditions (see section 7).

10.3. **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

10.4. **Conditions to Avoid:** Direct sunlight, extremely high or low temperatures, heat, hot surfaces, sparks, open flames, incompatible materials, and other ignition sources.

10.5. **Incompatible Materials:** Strong acids, strong bases, strong oxidizers.

10.6. **Hazardous Decomposition Products:** Thermal decomposition generates : carbon oxides (CO, CO_2). Hydrocarbons.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Overexposure may be irritating to the respiratory system.

Symptoms/Injuries After Skin Contact: Repeated or prolonged skin contact may cause irritation.

Symptoms/Injuries After Eye Contact: Direct contact with the eyes is likely irritating.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: Not Classified

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Paraffin oils (8012-95-1)	
LC50 Inhalation Rat	2062 ppm/4h
ATE US (gases)	2,062.00 ppmV/4h
IARC Group	1
Heavy paraffinic, Distillates, petroleum, hydrotreated heavy paraffinic (64742-54-7)	
LD50 Oral Rat	> 2000 mg/kg
LD50 Dermal Rabbit	> 2 g/kg
Petroleum distillates, solvent dewaxed (64742-65-0)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 5 g/kg

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life.

Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts (68649-42-3)

LC50 Fish 1	1.0 - 5.0 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 1	1 - 1.5 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	10.0 - 35.0 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])

Petroleum distillates, solvent dewaxed (64742-65-0)

EC50 Daphina 1	> 1000 mg/L (Exposure time: 48 h – Species: Daphnia magna)
LC50 Fish 1	> 5000 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)

Distillates, petroleum, hydrotreated heavy paraffinic (64742-54-7)

LC50 Fish 1	> 5000 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	> 1000 mg/l (Exposure time: 48 h - Species: Daphnia magna)

12.2. Persistence and Degradability

Not available

12.3. Bioaccumulative Potential

Not available

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way. Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT Not regulated for transport
14.2. In Accordance with IMDG Not regulated for transport
14.3. In Accordance with IATA Not regulated for transport
14.4. In Accordance with TDG Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

SARA Section 311/312 Hazard Classes :Delayed (chronic) health hazard

15.2. US State Regulations

Paraffin oils (8012-95-1)

U.S.	California	: Right To Know List – Warning: This material may contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5)
U.S.	Massachusetts	: Right To Know List
U.S.	New Jersey	: Right to Know Hazardous Substance List
U.S.	Pennsylvania	: RTK (Right to Know) List

15.3. Canadian Regulations

WHMIS Classification : Not Classified

Phosphorodithioic acid, O,O-di-C1-14-alkyl esters, zinc salts (68649-42-3)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification : Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Paraffin oils (8012-95-1)

Listed on the Canadian DSL (Domestic Substances List)
Listed on the Canadian IDL (Ingredient Disclosure List)
IDL Concentration 1 %

WHMIS Classification : Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

Petroleum distillates, solvent dewaxed (64742-65-0)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification : Uncontrolled product according to WHMIS classification criteria

Distillates, petroleum, hydrotreated heavy paraffinic (64742-54-7)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification : Uncontrolled product according to WHMIS classification criteria

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS

contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 06/05/2020
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 4	Hazardous to the aquatic environment - Chronic Hazard Category 4
Asp. Tox. 1	Aspiration hazard Category 1
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Skin Irrit. 2	Skin corrosion/irritation Category 2
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H318	Causes serious eye damage
H391	Collect Spillage
H401	Toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects
H413	May cause long lasting harmful effects to aquatic life
H501	Dispose of contents/container in accordance with local, regional, national, and international regulations.

Party Responsible for the Preparation of This Document

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This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. North American Lubricants Company assumes no responsibility for injury from the use of the product described herein.

North America GHS US 2012 & WHMIS 2

Safety Data Sheet

Safety Data Sheet Portland Cement

Section 1. Identification

GHS product identifier:	Portland Cement
Chemical name:	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.
Other means of identification:	Cement, ASTM Type I, II, III, V, Portland Limestone Cement, Plastic Cement, Hydraulic Cement, Oilwell Cement, Well Cement, Class G Cement, InterCem, EcoCemPLC, Type IL, CSA Type GU, GUb, GUL, MS, MH, MHL, HE, HEL, LH, LHL, HS
Relevant identified uses of the substance or mixture and uses advised against:	Building materials, construction, a basic ingredient in concrete.
Supplier's details:	300 E. John Carpenter Freeway, Suite 1645 Irving, TX 75062 (972) 653-5500
Emergency telephone number (24 hours):	**CHEMTREC: (800) 424-9300**

Section 2. Hazards Identification

Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.

OSHA/HCS status:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture:	SKIN SENSITIZATION – Category 1; H317 CARCINOGENICITY – Category 1A; H350 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) – Category 3; H335 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) – Category 1; H372 SKIN CORROSION/IRRITATION – Category 2; H315 SERIOUS EYE DAMAGE/EYE IRRITATION – Category 1; H318

GHS label elements

Hazard pictograms:

Signal word: Danger

Hazard statements:
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause respiratory irritation.
May cause cancer.

Precautionary statements:

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Use outdoors in a well ventilated area. Wash any exposed body parts thouroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.Contaminated clothing must not be allowed out of the workplace.

Response: If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs.If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do.If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.

Storage: Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.

Disposal:

Hazards not otherwise classified (HNOC):	Dispose of contents/container in accordance with local/regional/national/international regulations.
Supplemental Information:	None known
	Respirable Crystalline Silica (RCS) may cause cancer. Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC and NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

Section 3. Composition/information on ingredients

Substance/mixture:	Mixture
Chemical Name:	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.

CAS number/other identifiers

Ingredient name	%	CAS number
Portland Cement	100%	65997-15-1
The structure of Portland cement may contain the following in some concentration ranges:		
Calcium oxide	0-5	1305-78-8
Quartz	0-0.1	14808-60-7
Gypsum	4-9	13397-24-5
Limestone	0-5	1317-65-3
Magnesium oxide	0-4	1309-48-4
Gypsum, limestone and magnesium oxide are not classifiable as a hazard under Title 29 Code of Federal Regulations 1910.1200.		
Hexavalent chromium*	Trace	18450-29-9
***Hexavalent chromium is included due to dermal sensitivity associated with the component.**		

Any concentration shown as a range is to protect confidentiality or is due to process variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye Contact:	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.
Inhalation:	Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of portland cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in a recovery position and get medical attention immediately. Maintain an open airway.
Skin Contact:	Get medical attention immediately. Heavy exposure to portland cement dust, wet concrete or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess portland cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH natural soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposure to wet cement, cement mixtures or liquids from wet cement. Burns should be treated as caustic burns. Portland cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.
Ingestion:	Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small

quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed potential acute health effects

Eye contact:	Causes serious eye damage.
Inhalation:	May cause respiratory irritation.
Skin contact:	Causes severe burns. May cause an allergic skin reaction.
Ingestion:	May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact:	Adverse symptoms may include the following: pain, watering and redness.
Inhalation:	Adverse symptoms may include the following: respiratory tract irritation and coughing.
Skin contact:	Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur.
Ingestion:	Adverse symptoms may include the following: stomach pains.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments:	Not applicable.
Protection of first-aiders:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media:	Do not use water jet or water-based fire extinguishers.
Specific hazards arising from the chemical:	No specific fire or explosion hazard.
Hazardous thermal decomposition Products:	Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides.
Special protective actions for fire-fighters:	Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders:	For personal protective clothing requirements, please see Section 8.
Environmental precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

Methods and materials for containment and cleaning up

Small spill: Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.

Large spill: Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: A key to using the product safely requires the user to recognize that portland cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with cement. Do not get portland cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains portland cement unless appropriate procedures and protection are available. Portland cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Particulates not otherwise classified (CAS SEQ250)	**ACGIH TLV (United States, Canada)** TWA: 3 mg/m³. Form: Respirable particles TWA: 10 mg/m³. Form: Inhalable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Portland Cement	**ACGIH TLV (United States and Canada)** TWA: 1 mg/m³. Form: Respirable dust **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust

Calcium oxide	**ACGIH TLV (United States and Canada)** TWA: 2 mg/m³ 8 hours **OSHA/MSHA PEL (United States)** TWA: 5 mg/m³ 8 hours.
Limestone	**ACGIH TLV (United States, Canada)** TWA: 3 mg/m³. Form: Respirable particles TWA: 10 mg/m³. Form: Inhalable particles **OSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 15 mg/m³. Form: Total dust **MSHA PEL (United States)** PEL: 5 mg/m³. Form: Respirable fraction PEL: 10 mg/m³. Form: Total dust
Magnesium oxide	**ACGIH TLV (United States and Canada)** TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction **OSHA PEL (United States)** TWA: 15 mg/m³ 8 hours. Form: Total particulates
Calcium sulfate (gypsum)	**ACGIH TLV (United States, Canada)** TWA: 10 mg/m³ 8 hours. Form: Respirable fraction **OSHA PEL Z-1 (United States)** TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust
Crystalline Silica (Quartz) (CAS 14808-60-7)	**ACGIH TLV (United States)** TWA: 0.025 mg/m³. Form: Respirable fraction **OSHA PEL (United States)** TWA: 0.05 mg/m³. Form: Respirable **MSHA PEL (United States)** TWA: 10/(%SiO2 + 2) in mg/m3 **Provincial Exposure Limits (Canada, various)** ▪ **Alberta (OHS Code)** 0.025 mg/m³ 8 hour TWA ▪ **British Columbia (WorkSafeBC OHS Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **British Columbia (Health, Safety & Reclamation Code, Mines Act)** 0.1 mg/m³ 8 hour TWA ▪ **Manitoba (Workplace Safety and Health Regulation)** 0.025 mg/m³ 8 hour TWA ▪ **New Brunswick** 0.025 mg/m³ 8 hour TWA ▪ **Newfoundland** 0.025 mg/m³ 8 hour TWA ▪ **Nova Scotia** 0.025 mg/m³ 8 hour TWA ▪ **Ontario (O. Reg 490/09; and O. Reg. 833)** 0.1 mg/m³ 8 hour TWA ▪ **Prince Edward Island** 0.025 mg/m³ 8 hour TWA ▪ **Quebec (Regulation Respecting OHS, Chapter S-2.1, r. 13)** 0.1 mg/m³ 8 hour TWA ▪ **Saskatchewan (OHS Regulations)** 0.05 mg/m³ 8 hour TWA

Appropriate engineering controls: Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Exposure guidelines: OSHA PELs, MSHA PELs, Canadian Provincial OELs, and ACGIH TLVs are 8-hr TWA values. Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled. Terms including “Particulates Not Otherwise Classified,” “Particulates Not Otherwise Regulated,” Particulates Not Otherwise Specified,” and “Inert or Nuisance Due” are often used interchangeably; however, the user should review each agency’s terminology for differences in meanings.

Individual protection measures

Hygiene measures: Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by portland cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with portland cement, garments should be removed and replaced with clean, dry clothing.

Eye/face protection: To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet cement. Wearing contact lenses when working with cement is not recommended.

Skin protection

Hand protection: Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get portland cement inside gloves.

Body protection: Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet portland cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent portland cement from getting inside them. Do not get portland cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with cement and immediately wash exposed areas of the body.

Other skin protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved. .

Respiratory protection: Use properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical State:	Solid. [Powder]	**Lower and Upper explosive flammable limits**	Not applicable
Color:	Gray or white	**Vapor pressure:**	Not applicable
Odor:	Odorless	**Vapor density:**	Not applicable
Odor threshold:	Not available	**Relative density:**	2.3 to 3.1
pH:	>11.5 [Conc. (% w/w): 1%]	**Solubility:**	Slightly soluble in water
Melting point:	Not available	**Solubility in water:**	0.1 to 1%
Boiling point:	>1000°C (>1832°F)	**Partition coefficient: n-octanol/water:**	Not applicable
Flash point:	Not flammable. Not combustible	**Auto-ignition temperature:**	Not applicable
Burning time:	Not available	**Decomposition temperature:**	Not available
Burning rate:	Not available	**SADT:**	Not available
Evaporation Rate:	Not applicable	**Viscosity:**	Not applicable
Flammability (solid, gas):	Not applicable		

Section 10. Stability and reactivity

Reactivity: Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete.

Chemical Stability: The product is stable.

Possibility of hazardous reactions: Under normal circumstances of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Portland cement is highly alkaline and will react with acids to produce a violent, heat-generating reaction. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas-silicon tetrafluoride.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity: Portland Cement LD50/LC50 = Not available

Irritation/Corrosion: **Skin:** May cause skin irritation. May cause serious burns in the presence of moisture.
Eyes: Causes serious eye damage. May cause burns in the presence of moisture.
Respiratory: May cause respiratory tract irritation.

Sensitization: May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.

Mutagenicity: There are no data available.

Carcinogenicity:
Classification below:

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Cement, portland, chemicals	-	-	A4	-
Crystalline Silica (Quartz) (CAS 14808-60-7)	Listed	1	A2	Known to be a human carcinogen.

Reproductive toxicity: There are no data available.

Teratogenicity: There are no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation
Cement, portland, chemicals	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of Exposure	Target Organs
Crystalline Silica (Quartz) (CAS 14808-60-7)	Category 1	Inhalation	Respiratory tract and kidneys

Aspiration hazard: There are no data available.

Information on the likely routes of exposure

Potential acute health effects:
Eye contact: Causes serious eye damage.
Inhalation: May cause respiratory irritation.
Skin contact: Causes severe burns. May cause an allergic skin reaction.
Ingestion: May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics:
Eye contact: Adverse symptoms may include the following: pain, watering, redness.
Inhalation: Adverse symptoms may include the following: respiratory tract irritation, coughing
Skin contact: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur
Ingestion: Adverse symptoms may include the following: stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure:
Short term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Long term exposure
Potential immediate effects: No known significant effects or critical hazards.
Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects:
General: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: Portland cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity: Acute toxicity estimates: There are no data available.

Section 12. Ecological Information

Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish-Oreochromis niloticus-Juvenile (Fledgling, Hatchling, Weanling)	46 days

Persistence and degradability: There are not data available.
Bioaccumulative potential: There are not data available.
Mobility in soil: Soil/water partition coefficient (Koc): Not available.
Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with soil, waterways, drains and sewers.

Section 14. Transportation information

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	None	None	None
Canada TDG	-	-	-
Additional information	-	-	-

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

Section 15. Regulatory Information

TSCA 6 final risk management: Chromium, ion (Cr6+)
United States inventory (TSCA 8b): Cements are considered to be statutory mixtures under TSCA. CAS 65997-15-1 is included on the TSCA inventory.
CERCLA: This product is not listed as a CERCLA substance
Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) – Not listed
Clean Air Act Section 602: Class I Substances - Not listed
Clean Air Act Section 602: Class II Substances - Not listed
DEA List I Chemicals: (Precursor Chemicals) – Not listed
DEA List II Chemicals: (Essential Chemicals) – Not listed
Canada NSNR Status – Listed on DSL or exempt

SARA 311/312

Classification: Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	0-5	No	No	No	Yes	No
Quartz	>0.1	No	No	No	No	Yes
Chromium, ion (Cr6+)	<0.1	No	No	No	Yes	Yes

SARA 313

	Product name	CAS number	%
Form R-Report requirements	Chromium, ion (Cr6+)	8540-29-9	<0.1

State regulations

Massachusetts: The following components are listed: cement, portland, chemicals, limestone
New York: None of the components are listed.
New Jersey: The following components are listed: cement, portland, chemicals, gypsum, limestone
Pennsylvania: The following components are listed: cement, portland, chemicals, gypsum, limestone

California Prop. 65

WARNING: This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes	No	No	No
Chromium, ion (Cr6+)	Yes	Yes	0.001µg/day (inhalation)	8.2 micrograms/day (ingestion)

International regulations

International lists: **Canadian Domestic Substances List (DSL):** Portland cement is included on the DSL.
Mexico Inventory (INSQ): All components are listed or exempted.

WHMIS Classification: D2A “Materials Causing Other Toxic Effects”

Section 16. *Other Information*

Date of issue: 01/01/2023
Replaces: 01/01/2022
Revised Section(s):

Notice to reader

While the information provided in this safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY Heidelberg Materials, except that the product shall conform to contracted specifications. The information provided herein was believed by the Heidelberg Materials to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

Abbreviations

ACGIH — American Conference of Governmental Industrial Hygienists
CAS — Chemical Abstract Service
CERCLA — Comprehensive Emergency Response and Comprehensive Liability Act
CFR — Code of Federal Regulations
DOT — Department of Transportation
GHS — Globally Harmonized System
HEPA — High Efficiency Particulate Air
IATA — International Air Transport Association
IARC — International Agency for Research on Cancer
IMDG — International Maritime Dangerous Goods
NIOSH — National Institute of Occupational Safety and Health
NOEC — No Observed Effect Concentration
NTP — National Toxicology Program
OSHA — Occupational Safety and Health Administration
PEL — Permissible Exposure Limit
REL — Recommended Exposure Limit
RQ — Reportable Quantity
SARA — Superfund Amendments and Reauthorization Act
SDS — Safety Data Sheet
TLV — Threshold Limit Value
TPQ — Threshold Planning Quantity
TSCA — Toxic Substances Control Act
TWA — Time-Weighted Average
UN — United Nations

APPENDIX D

Project Aviation Safety Plan

PROJECT AVIATION SAFETY PLAN (PASP)

For Aviation Activities Associated with San Bernardino National Forest **22 June 2024**
Special Use Permit No. FCD728503
BlueTriton Brands (Permittee)

Mission:	Project Name:	Unit:	Fixed Wing ☐
Personnel Transportation	Arrowhead/BTB Special Special Use Permit	San Bernardino National Forest, Supervisor's Office	Rotor Wing ☒

Anticipated Project Date(s): Bi-Weekly

Project Plan Prepared by: Airwest Helicopters, Inc.	Title:	Date:
Project Plan Reviewed by: Eric Fraser 619-843-6050	Title: Director of Operations	Date:
Project Plan Reviewed by: Dan Catalano 949-292-7957	Title: Pilot	Date:
Project Plan Reviewed by:	Title:	Date:
Project Plan Reviewed by:	Title:	Date:
Project Plan Reviewed by:	Title:	Date:
Project Plan Approved by:	**Title:**	**Date:**

PROJECT DESCRIPTION/MISSION OBJECTIVES:

Compliance with the operational procedures outlined in this Project Aviation Safety Plan is required.

Conduct transportation of personnel to remote well/spring facilities in Strawberry Creek for Arrowhead/BTB. There are five primary sites: Pad#2, Pad #7, Meadow Pad, New Pad and Strawberry Pad. Each specific location is listed and described below. Two additional sites in Warm Creek and City Creek are also utilized for biological/hydro studies.

Each site is surrounded by thick chaparral whitethorn brush and other vegetation that precludes safe access by personnel and required maintenance equipment by other means without extensive road and trail construction. Aircraft have historically provided the safest and most efficient access with minimal impact.

Objective of the missions is to transport personnel and equipment to the sites initiating from a base of operations on private property at the San Manuel Band of Mission Indians Arrowhead Springs Campus or San Bernardino/ Redlands Airports.

JUSTIFICATION FOR AIRCRAFT USE:

Site cannot be accessed by land due to steep slope, thick chaparral whitethorn brush, and heavy riparian vegetation. Existing helispots are located next to facilities in flat open areas. No roads exist in the area. Highway 18 is the closest road and is located from approximately 600 feet to 1.5 miles away upslope - elevation of Highway 18 is at 5,600 feet. The helispots range from 3,400 feet mean sea level (msl) to 5,000 feet msl.

GENERAL LOCATION/DESCRIPTION
(Provide description and attach map—map must include aerial hazards)

1. Pad #2: 34*13'42"N / 117*14'06"W 5,100 feet msl
   1,400 feet south of Strawberry Peak Lookout / 4.6 miles west of Heaps Peak Heliport
2. Pad #7: 34*13'33"N / 117*13'45"W 5,000 feet msl
   2,700 feet south of Strawberry Peak Lookout / 3.8 miles west of Heaps Peak Heliport
3. Meadow Pad: 34*13'12"N / 117*13'57"W 4,200 feet msl
   4,400 feet south of Strawberry Peak Lookout / 4.5 miles west of Heaps Peak Heliport
4. New Pad: 34*12'48"N / 117*13'57"W 4,000 feet msl
   1.3 miles south of Strawberry Peak Lookout / 4.7 miles west of Heaps Peak Heliport
5. Strawberry Pad: 34*12'27"N / 117*13'49"W 3,400 feet msl
   1.7 miles south of Strawberry Peak Lookout / 4.7 miles west of Heaps Peak Heliport

Aerial hazards may include loose vegetation or rocks on the sites.

AIRCRAFT INFORMATION		
Cooperator ☐ **/ Agency** ☐ **/ Vendor** ☒ **/ Military /RAIDS** ☐ **/ Other** ☐		
Type of Flight: Personnel Transportation	**Desired Make/Model:** MD500/B206/AS350	
Vendor: Airwest Helicopters Inc.	**Phone:** 619-843-6050	**Cell:**
Aircraft N#: TBD	**Make & Model:** MD500/B206/AS350	**Aircraft Color:** TBA
Pilot Name: TBD	**Pilot Contact number:** TBD	
Pilot Carded: Yes *X* **No Expiration Date:** TBD	**A/C Carded: Yes** *X* **No Expiration Date:**	
Type Procurement: N/A	**Charge Code:** N/A	
Estimated Flight Hours: Variable – TBD	**Estimated Cost:** CONFIDENTIAL	

SUPERVISION	
Project Aviation Manager: Eric Fraser	**Contact Number:** 619-843-6050
Unit Aviation Officer:	**Contact Number:**

PARTICIPANTS – list individuals involved in flight(s)	
Name: TBA on daily report	
Name:	
Name:	
Name:	
Name:	
Name:	
Name:	
Name:	

CARGO		
Weight: TBD	**Hazardous Materials** ☐ **Yes** ☐ **No**	**Pilot Briefed** ☐ **Yes** ☐ **No**
Weight:	**Hazardous Materials** ☐ **Yes** ☐ **No**	**Pilot Briefed** ☐ **Yes** ☐ **No**

FLIGHT FOLLOWING: Airwest Helicopter AFF / Latitude Aircraft Tracking		
Flight Follow: AFF Radio (15 minute check in)	**Request or Flight #:** ☐	
FM Receive:	**FM Transmit:**	**Tones:**
FM Receive:	**FM Transmit:**	**Tones:**
FM Receive:	**FM Transmit:**	**Tones:**
AM Air to Air: 122.925	**AM Unicom:** 123.025	**Other:**

PERFORMANCE PLANNING
The pilot is responsible for the accurate completion of load calculations. Trained personnel shall ensure that aircraft scheduled are capable of performing the mission(s) safely and within the capabilities of the aircraft selected. The DOPS/CP or designee shall ensure that manifests and load calculations/weight and balance calculations are completed properly using accurate environmental and aircraft data.

PERSONAL PROTECTIVE EQUIPMENT	
Type of Operation – check applicable boxes	**Personal – Personnel Protective Equipment Requirements**
X Rotor Wing Ground Operations	Loading and unloading of personnel and equipment, coordination of delivery and extraction of equipment.
X Rotor Wing All Flights	Flight Helmets at the discretion of the PIC.
X Doors off Flight	Personnel will remain seated and inside fuselage with standard restraints during all flights.

SEARCH AND RESCUE – EMERGENCY RESPONSE

Crash/Search and Rescue Procedures:

- ~ **Contact Airwest Helicopters assigned Flight Following via cell phone who will initiate the Interagency Aviation Incident/Accident Response Plan.** This initiation includes accomplishing all emergency and administrative notifications.
- ~ **On-site emergency response will be handled by the aircraft personnel and other project personnel. Emergency 911 system will be initiated.**

SPECIAL CONSIDERATIONS AND JUSTIFICATIONS:
(List justifications for deviating from SOP, policy etc.)

None required.

CRASH RESCUE/MEDI-EVAC PLAN – highlighted area is the minimum information regarding medical/emergency response to be filled out prior to review and approval. The remaining fields should be completed as much as practical prior to the day of operation.

General Instructions:

In the event of an accident, the Strawberry Creek Project Operations project manager will supervise and coordinate the crash rescue activities. Specific crash rescue duties will be assigned to project operations personnel each morning before flights of any kind. Crash rescue and first aid equipment will be located near the helispot operations site and equipment's location made known to all personnel. Information and instructions will be sent/received through the local communications.

EMT (S) ON PROJECT	
Names	
AVAILABLE MEDIVAC HELICOPTERS	
FAA # 40K	Contact SBC SO 909-387-8313
Litter/Rappel/Extraction Capable? Hoist Capable w/ALS	
Remarks	

NEAREST MEDICAL FACILITY	Name/Location Loma Linda Medical Center SB 647 B-1	
Latitude: 34 3.00	Longitude: -117 17.31	Contact Freq: N/A

SPECIFIC INFORMATION AND INSTRUCTIONS (Utilize cell phone if possible. Do not use names over the radio.)

1.	Nature of the injury(s)/illness
2.	Is medical help needed? If available supply vital signs!
3.	What transportation is needed? Is patient(s) ambulatory?
4.	Location of victim.
5.	Route to be taken (use land marks as guide).

6.	Equipment needed.
7.	Name of contact on site.
8.	Notify appropriate agency line officer.

SITE CONDITIONS		
Latitude:	Longitude:	Contact Frequency:
Wind Speed:	Elevation (msl):	Temperature:
Terrain Factors:	Helispot Minimum Size:	
Proximity of Helispot to Injury Site :	Visibility/Sunrise/Sunset Limitations:	
Flight Hazards:		
Other Aircraft in Area (Call Signs & Frequencies):		

COMMUNICATIONS PLAN

Communication with on-site / remotely deployed personnel via cell phone or supplied hand held radios. Frequencies used will be determined at time of mission.

RISK ASSESSMENT MATRIX

Refer to Airwest Helicopters, Inc. Aviation Mission Safety Matrix

SAFETY MANAGEMENT SYSTEM ASSESSMENT AND MITIGATION

Refer to Airwest Helicopters, Inc. SMS provided by PRISIM / ARGUS Inc.

PROJECT AVIATION SAFETY PLAN BRIEFING

Standard Airwest Helicopters, Inc. Aircraft Safety Briefings will be conducted on site with all participating personnel by the Pilot in Command of the mission or his / her designee.

PROJECT AVIATION SAFETY PLAN BRIEFING SIGNATURE PAGE

Attendees Signature and Concurrence:

Name	Project Responsibility/Role	Date

SMALL UNMANNED AIRCRAFT SYSTEMS

Project Name:
For Aviation Activities Associated with San Bernardino National Forest
Special Use Permit No. FCD728503
BlueTriton Brands (Permittee)

Project Objectives:

Permitee will conduct periodic vegetation surveys and assessments of riparian conditions using information and data gathered from operation of Small Unmanned Aircraft Systems (sUAS). The sUAS and pilot will be flown by helicopter to one of the established helispots and will operate the sUAS from a position near the helispot. Pilot requirements, aircraft requirements, and safety rules are outlined below.

Justification:

Conduct periodic aerial photographic survey of vegetation conditions in support of SUP No. FCD728503.

Project Dates:

Monthly.

Aircraft:

All sUAS flight activity will be conducted by a commercial sUAS operator within the provisions of Part 107.

Aircraft Requirements

- All sUAS must be registered in accordance with Federal Aviation Administration (FAA) rules. The individual responsible for sUAS procurement is responsible for registering the sUAS(s) with the FAA.
- All sUAS must weigh less than 55 pounds (25 kilograms). This includes any payload (camera or other data-collection equipment, packages, etc.).
- In addition to the preflight inspection checklist, remote pilots, or other designated maintenance personnel should take care to regularly maintain sUAS in accordance with manufacturer recommendations to ensure they remain in good working order.
- All sUAS should be maintained so that should the FAA make a request, any applicable maintenance records for testing and inspection can be presented.

Pilot Requirements

- Any flight of a sUAS must be conducted by someone designated as the remote pilot in command for any operation. The remote pilot must hold a valid Remote Pilot Airman Certificate granted by the FAA, which must be kept on their person while operating a sUAS.
- All sUAS pilots must abide by Part 107 of the FAA sUAS regulations, which went into force on 26 August 2016.
- All remote pilots must abide by the Operating Rules listed in this policy and all other applicable rules and regulations as set forth by the FAA.
- Part 107 of the FAA sUAS regulations outlines standard operating rules that must be followed by all remote pilots.

Participants:

Pilot and visual observer when required.

Flight Plan and Aerial Hazard Analysis:

For all flights, it is the policy for the remote pilot in command to create a written or verbal flight plan and review same with any visual observer or other employees or contractors who will be participating or observing the operation.

The flight plan should take into account (1) the operational objective, (2) surrounding buildings and other topography, (3) weather patterns, and (4) special considerations like nearby airports, hospitals, schools, and special events. In particular, it should also take into account privacy considerations. Those involved in the operation must notify third parties who may be within or near the flight plan of the impending operations.

Protective Clothing/Equipment:

Personal Protective Equipment (PPE) should be used as required based on observed hazards on the ground at the pilot location. PPE may include but is not limited to:

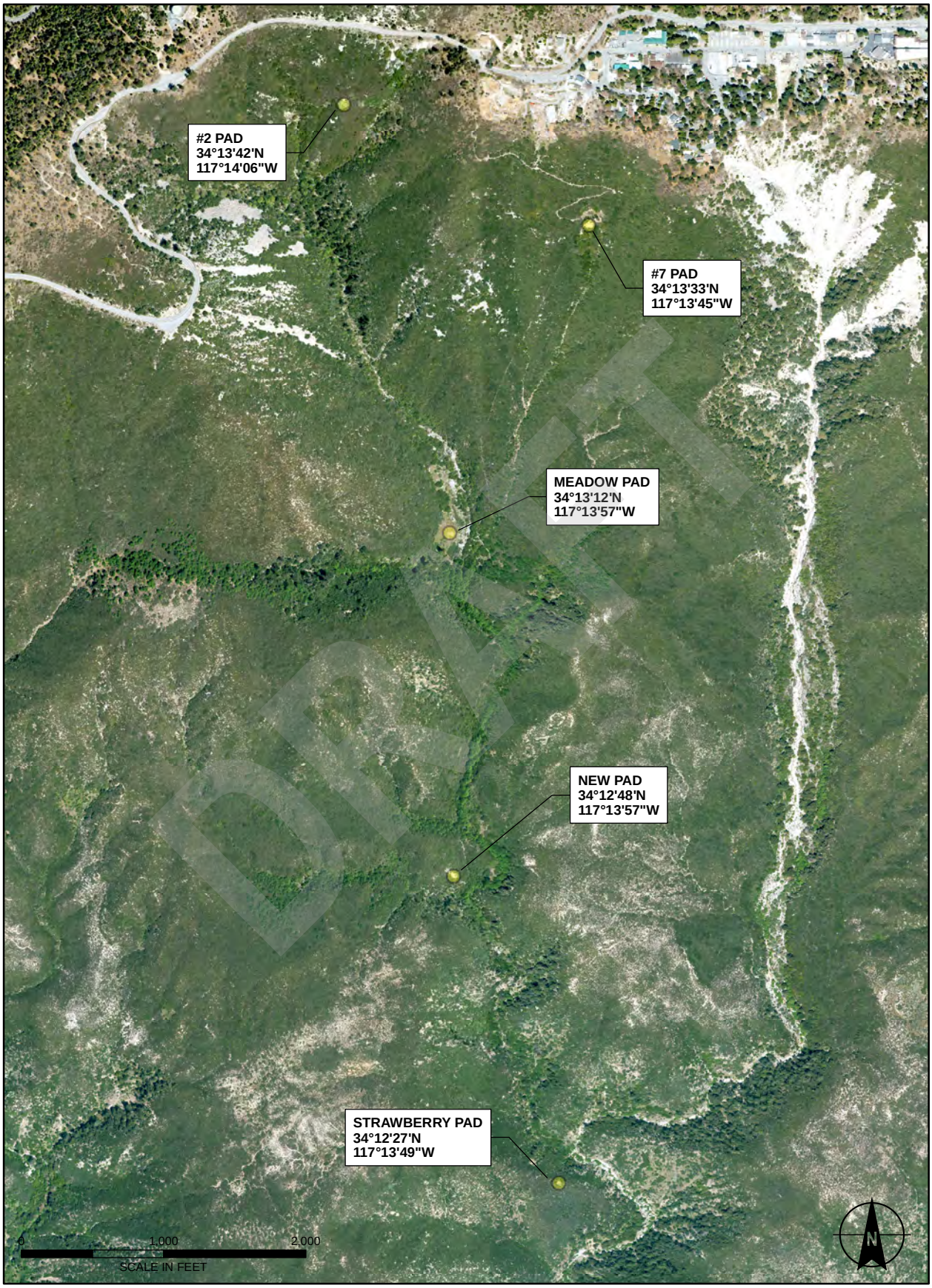
- Hard hat,
- Safety glasses,
- High-visibility reflective vest,
- Long sleeve shirt/jacket,
- Long pants, and
- Snake gaiters.

Load Calculation and Weight and Balance:

All sUAS must weigh less than 55 pounds (25 kilograms). This includes any payload (camera or other data-collection equipment, packages, etc.).

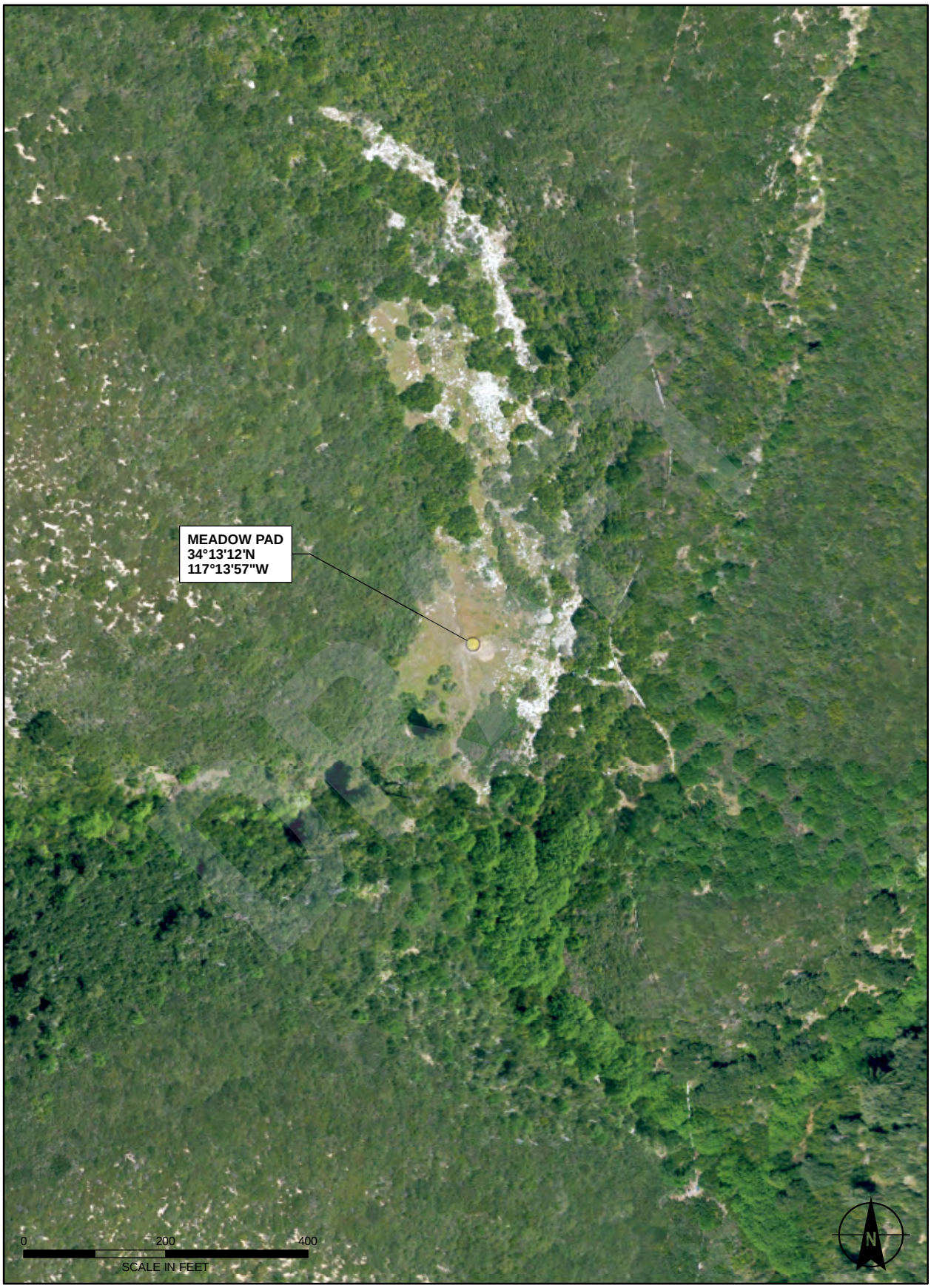
Hazards:

Aerial hazards may include vegetation, tree limbs, steep terrain, and loose vegetation or rocks at the landing site.

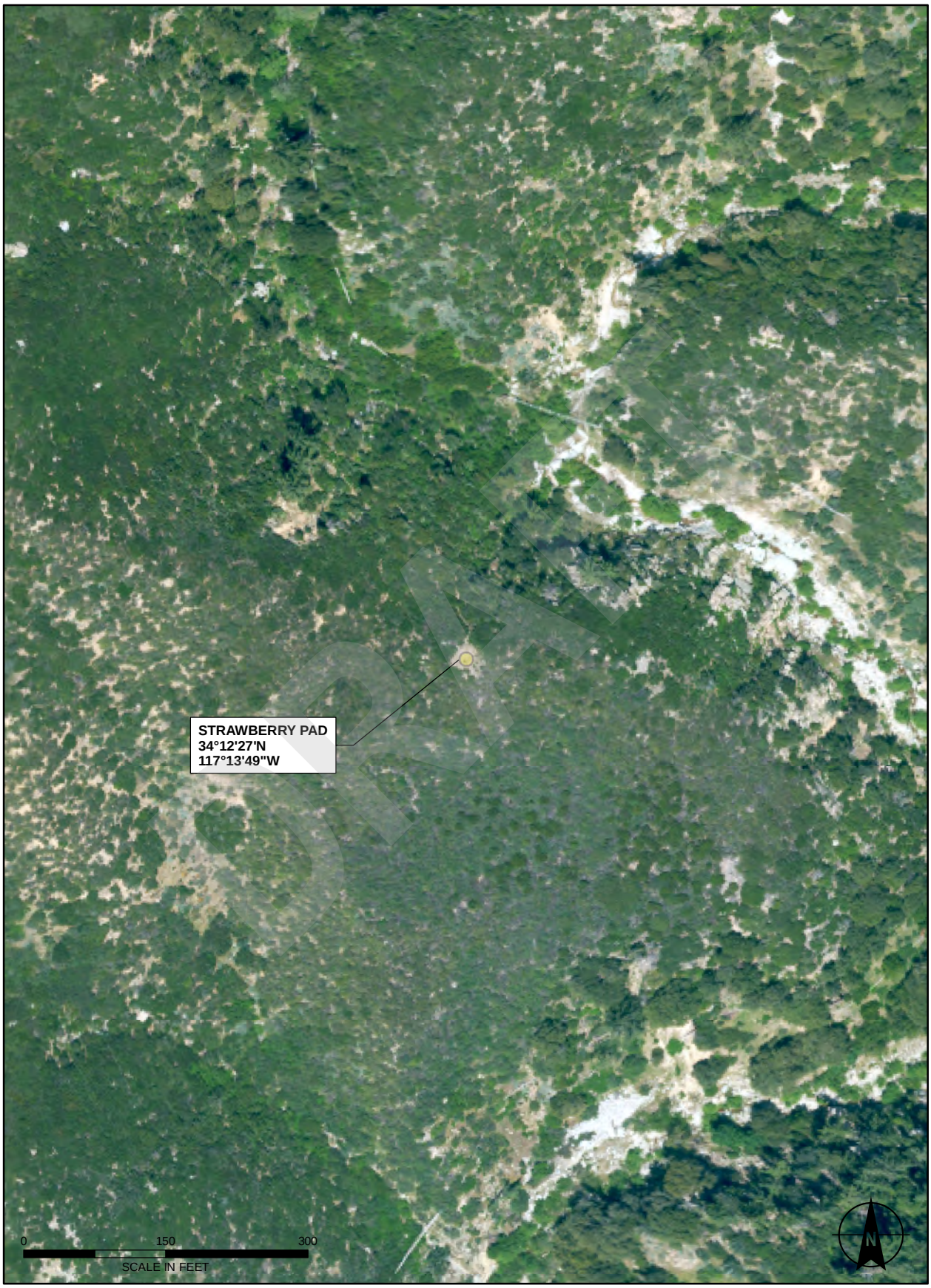

#2 PAD
34°13'42'N
117°14'06"W
#7 PAD
34°13'33'N
117°13'45"W
MEADOW PAD
34°13'12'N
117°13'57"W
NEW PAD
34°12'48'N
117°13'57"W
STRAWBERRY PAD
34°12'27'N
117°13'49"W
0
1,000
2,000
SCALE IN FEET
N
DRAFT


CA-18
#2 PAD
34°13'42'N
117°14'06"W
0
200
400
SCALE IN FEET
N


#7 PAD
34°13'33'N
117°13'45"W
0
200
400
SCALE IN FEET
N


MEADOW PAD
34°13'12'N
117°13'57"W
0
200
400
SCALE IN FEET
N


NEW PAD
34°12'48'N
117°13'57"W
0
200
400
SCALE IN FEET
N


STRAWBERRY PAD
34°12'27'N
117°13'49"W
0
150
300
SCALE IN FEET
N

APPENDIX E

Straw Wattle Material Property Data Sheet

MATERIAL PROPERTY DATA SHEET

WESTERN GREEN

Straw Wattle

Temporary • Degradable • Straw Fiber • Sediment Control Device

DESCRIPTION

Western Green manufactures Straw Wattles which are sediment control logs designed for use in sediment control applications. The Straw Wattles consist of 100% clean, weed free straw fiber matrix confined by a degradable synthetic mesh to form a log of specific length and diameter. Straw Wattles are designed to reduce hydraulic energy and filter sediment laden flow in channels and on slopes. The wattles are flexible to conform to the soil surface and are secured by staking.

Each Straw Wattle is made in the USA and manufactured under Western Green's Quality Assurance Program to ensure a continuous distribution of fibers and consistent dimensions.

Material Content	
Fiber Fill	100% clean, weed free straw fiber
Outer Mesh	Hecy Duty Synthetic
Configuration	Cylindrical with Closed Ends
End Closure	Hog ring or Tied

Specified Expected Values			
Diameter	**10 ft (3.0 m)**	**20 ft (6.0 m)**	**25 ft (7.6 m)**
9 in (0.23 m)	14 lbs (6.4 kg) 1.4 lbs/ft (2.1 kg/m) 3.2 lbs/ft^3 (51.5 kg/m^3)	28 lbs (12.7 kg) 1.4 lbs/ft (2.1 kg/m) 3.2 lbs/ft^3 (51.5 kg/m^3)	35 lbs (15.9 kg) 1.4 lbs/ft (2.1 kg/m) 3.2 lbs/ft^3 (51.5 kg/m^3)
12 in (0.31 m)	25 lbs (11.3 kg) 2.5 lbs/ft (3.7 kg/m) 3.3 lbs/ft^3 (53 kg/m^3)	50 lbs (22.7 kg) 2.5 lbs/ft (3.7 kg/m) 3.3 lbs/ft^3 (53 kg/m^3)	
20 in (0.51 m)	50 lbs (22.7 kg) 5.0 lbs/ft (7.4 kg/m) 2.4 lbs/ft^3 (39 kg/m^3)	100 lbs (45.4 kg) 5.0 lbs/ft (7.4 kg/m) 2.4 lbs/ft^3 (39 kg/m^3)	

WESTERN GREEN

Rev. 5.2023
Scan for additional and updated product information

Western Green • 4609 E. Boonville-New Harmony Rd.
Evansville, IN 47725 • (800) 772-2040
westerngreen.com

Western Green
4609 E. Boonville-New Harmony Rd.
Evansville, Indiana 47725
Tel. 800.772.2040

www.westerngreen.com

01/01/2023

RE: Certification of Conformance and Delivery for ST-9X25

To Whom it May Concern:

This document has been drafted to provide certification as to the origin, properties and delivery of ST-9X25, a straw wattle. ST-9X25 is produced by Western Green (WG). Each wattle is subjected to regular inspection and testing in accordance with the WG Quality Assurance Program. Properties and specifications of the material are provided on document number WG_MPDS_Straw Wattles, attached as reference. Installation documentation may be found at www.westerngreen.com.

Since most WG products are sold to distributors and stocked, WG is typically unable to certify material type or quantity delivered to the project/project site. However, space is provided below for distributor/contractor certification of materials delivered to the project/project site.

To the best of our knowledge, the information included is accurate.

Jill Pack
Product Manager
Western Green

Standard Material Delivery Certification

Material Provided by (Distributor/Contractor): _____

Material Provided to (Contractor/Project): _____

Project Name / Project Number: _____

Rolls / Square Yards Provided: _____

Specification #: _____

Signature: _____ Date: _____

Title: _____

Western Green
4609 E. Boonville-New Harmony Rd.
Evansville, Indiana 47725
Tel. 800.772.2040

www.westerngreen.com

01/01/2023

RE: Certification of Conformance and Delivery for ST-12X10

To Whom it May Concern:

This document has been drafted to provide certification as to the origin, properties and delivery of ST-12X10, a straw wattle. ST-12X10 is produced by Western Green (WG). Each wattle is subjected to regular inspection and testing in accordance with the WG Quality Assurance Program. Properties and specifications of the material are provided on document number WG_MPDS_Straw Wattles, attached as reference. Installation documentation may be found at www.westerngreen.com.

Since most WG products are sold to distributors and stocked, WG is typically unable to certify material type or quantity delivered to the project/project site. However, space is provided below for distributor/contractor certification of materials delivered to the project/project site.

To the best of our knowledge, the information included is accurate.

Jill Pack
Product Manager
Western Green

Standard Material Delivery Certification

Material Provided by (Distributor/Contractor): _____

Material Provided to (Contractor/Project): _____

Project Name / Project Number: _____

Rolls / Square Yards Provided: _____

Specification #: _____

Signature: _____ Date: _____

Title: _____

Installation Instructions
Logs and Wattles

Step 1 - Site Preparation

Prepare site to design profile and grade. Remove debris, rocks, clods, etc.. Ground surface should be smooth prior to installation to ensure log remains in contact with slope.

Step 2 - Staple Selection

At a minimum, 1 in. by 1 in. by 24 in., stakes are to be used to secure the log to the ground surface. Installation in rocky, sandy or other loose soil may require longer stakes.

Slope Installation

Place RECP along slope to provide upstream apron for log. Secure RECP according to standard slope installation instructions including upstream anchor trench. Secure log to blanket, ensuring log remains in intimate contact with the RECP over the length of the installation. A minimum of one foot upstream apron and two foot downstream apron are required for installation. Subsequent, downslope rows of logs should be spaced appropriately for site conditions to minimize acceleration of flow. Further, log seams are to be offset to ensure continuous filtration. Figure A presents a schematic of a slope installation in profile view.

Channel Installation

Place RECP along channel to provide upstream and downstream apron for log identically to slope installation. Secure log to blanket, ensuring log remains in intimate contact with the RECP over the length of the installation. A minimum of one foot upstream apron and two foot downstream apron are required for installation. Subsequent, downslope rows of logs should be spaced appropriately for site conditions to minimize acceleration of flow. Further, log seams are to be offset to ensure continuous filtration. Figure A / Figure C presents a schematic of a channel installation.

Drain Filter Installation

Surround drain inlet to be protected with log, ensuring seams are overlapping to minimize flow circumventing log. Secure logs to ground surface ensuring the log remains in intimate contact with the ground surface over the entire installation. Provide RECP apron secured to the ground surface between drain and log.

Slope/Channel Installation

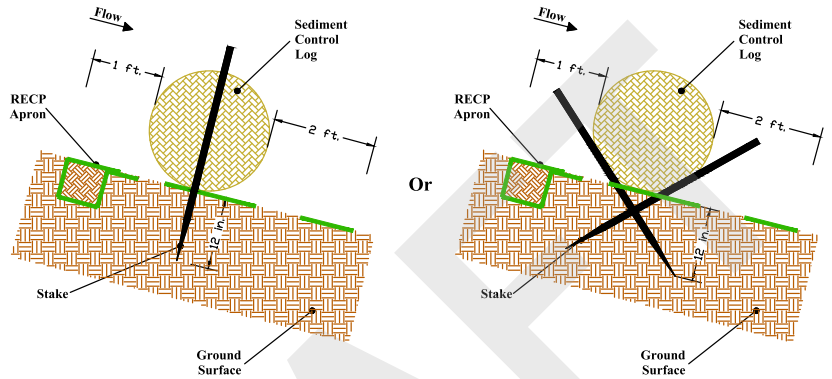


Figure A - Profile View

Flat Ground (Perimeter Guard) Installation

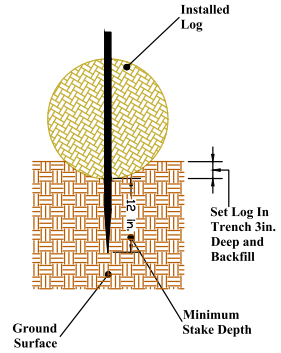
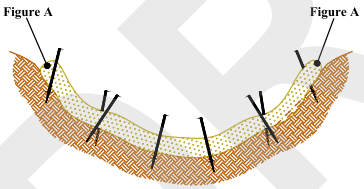


Figure B - Profile View

Channel Installation



Minimum stake in ground, 12 in.

Do not allow flow to overtop installation.

Figure C - Cross-Section View

Drain Filter

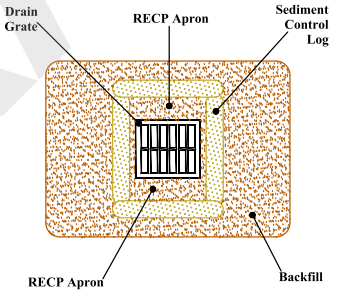


Figure D - Cross-Section View

Curbside Installation

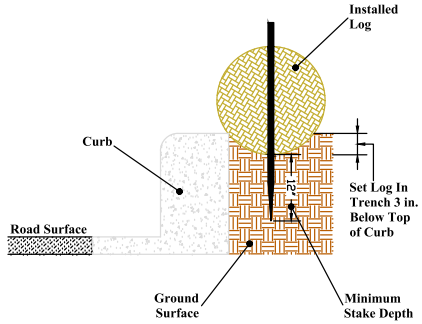


Figure E - Cross-Section View

WESTERN GREEN | WESTERN EXCELSIOR | NORTH AMERICAN GREEN | EAST COAST erosion control

Project: Standard Slope/Rainfall Layout - RECP

Shown: Isometric View of Slope, Fastener Placement, Some Fasteners and Vegetation Omitted for Clarity, Trenching and Overlap, NTS

Date: 4/4/2023
WG: 886-540-9810
www.westerngreen.com
www.westernexcelsior.com
www.nagreen.com

APPENDIX F

Native Plant Species List

ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
FERNS	
BLECHNACEAE	**DEER FERN FAMILY**
Woodwardia fimbriata	giant chain fern
DENNSTAEDTIACEAE	**BRACKEN FAMILY**
Pteridium aquilinum var. *pubescens*	western bracken
DRYOPTERIDACEAE	**WOOD FERN FAMILY**
Dryopteris arguta	California wood fern
Polystichum munitum	western sword fern
EQUISETACEAE	**HORSETAIL FAMILY**
Equisetum arvense	common horsetail
POLYPODIACEAE	**POLYPODY FAMILY**
Polypodium californicum	California polypody
PTERIDACEAE	**BRAKE FAMILY**
Pellaea andromedifolia	coffee fern
Pentagramma triangularis	goldenback fern
GYMNOSPERMS	
CUPRESSACEAE	**CYPRESS FAMILY**
Calocedrus decurrens	California incense cedar
PINACEAE	**PINE FAMILY**
Pseudotsuga macrocarpa	bigcone douglas-fir
MAGNOLIIDS	
LAURACEAE	**LAUREL FAMILY**
Umbellularia californica	California bay
ANGIOSPERMS (EUDICOTS)	
ADOXACEAE	**MUSKROOT FAMILY**
Sambucus nigra subsp. *caerulea*	blue elderberry
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**
Toxicodendron diversilobum	poison oak
APIACEAE	**CARROT FAMILY**
Osmorhiza brachypoda	California sweet-cicely
Sanicula bipinnata	poison sanicle
Sanicula crassicaulis	Pacific sanicle
ASTERACEAE	**SUNFLOWER FAMILY**
Ambrosia psilostachya	western ragweed
Artemisia douglasiana	mugwort
Baccharis salicifolia subsp. *salicifolia*	mule fat
Cirsium occidentale var. *californicum*	cobweb thistle
Corethrogyne filaginifolia	sand-aster

ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
Erigeron canadensis	horseweed
Eriophyllum confertiflorum	golden yarrow
Madia elegans	common madia
Madia glomerata	mountain tarweed
Madia gracilis	grassy tarweed
Malacothrix saxatilis	cliff malacothrix
Pseudognaphalium californicum	California everlasting
Pseudognaphalium canescens	felty everlasting
Pseudognaphalium stramineum	cotton-batting plant
Rafinesquia californica	California chicory
Solidago velutina subsp. *californica*	California goldenrod
Stephanomeria exigua	small wreathplant
BETULACEAE	**BIRCH FAMILY**
Alnus rhombifolia	white alder
BORAGINACEAE	**BORAGE FAMILY**
Cryptantha intermedia var. *intermedia*	common forget-me-not
Cryptantha nevadensis var. *rigida*	rigid cryptantha
Cryptantha sp.	cryptantha
Eriodictyon trichocalyx	hairy yerba santa
Nemophila menziesii	baby blue-eyes
Pectocarya linearis	sagebrush combseed
Phacelia cicutaria var. *hispida*	caterpillar phacelia
Phacelia minor	wild Canterbury-bell
Phacelia tanacetifolia	tansy phacelia
BRASSICACEAE	**MUSTARD FAMILY**
Barbarea orthoceras	erect-pod winter-cress
Boechera californica	California rock cress
Boechera shockleyi	Shockley's rock cress
Cardamine californica	milkmaids
Lepidium nitidum	peppergrass
Nasturtium officinale	water-cress
Turritis glabra	tower-mustard
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Lonicera subspicata	southern honeysuckle
CONVOLVULACEAE	**MORNING-GLORY FAMILY**
Calystegia macrostegia	western bindweed
CORNACEAE	**DOGWOOD FAMILY**
Cornus nuttallii	mountain dogwood

ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
Cornus sericea	creek dogwood
CRASSULACEAE	**STONECROP FAMILY**
Dudleya cymosa subsp. *pumila*	low canyon dudleya
Dudleya lanceolata	lance-leaved dudleya
CUCURBITACEAE	**GOURD FAMILY**
Marah macrocarpa	wild cucumber
DATISCACEAE	**DATISCA FAMILY**
Datisca glomerata	durango root
ERICACEAE	**HEATH FAMILY**
Arctostaphylos glauca	bigberry manzanita
FABACEAE	**LEGUME FAMILY**
Acmispon americanus var. *americanus*	Spanish clover
Acmispon argophyllus	silver leaf lotus
Amorpha fruticosa	western false indigo
Hosackia oblongifolia var. *oblongifolia*	narrow leaved lotus
Lathyrus vestitus	wild sweet pea
Lupinus latifolius var. *parishii*	Parish's stream lupine
Lupinus succulentus	arroyo lupine
Pickeringia montana	chaparral pea
Trifolium willdenovii	tomcat clover
FAGACEAE	**OAK FAMILY**
Quercus chrysolepis	canyon live oak
Quercus kelloggii	California black oak
GROSSULARIACEAE	**GOOSEBERRY FAMILY**
Ribes malvaceum	chaparral currant
Ribes nevadense	mountain pink currant
LAMIACEAE	**MINT FAMILY**
Salvia apiana	white sage
Stachys ajugoides	hedge-nettle
MONTIACEAE	**MINER'S LETTUCE FAMILY**
Claytonia perfoliata	miner's lettuce
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Clarkia purpurea	winecup clarkia
Clarkia rhomboidea	diamond clarkia
Epilobium canum	California fuchsia
Epilobium ciliatum	California cottonweed
Oenothera elata subsp. *hookeri*	evening primrose
OROBANCHACEAE	**BROOM-RAPE FAMILY**

ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
Castilleja minor subsp. *spiralis*	lesser paintbrush
PHRYMACEAE	**LOPSEED FAMILY**
Erythranthe floribunda	many flowered monkey flower
Erythranthe guttatus	common monkey-flower
Erythranthe microphylla	small leaved monkey-flower
Mimetanthe pilosa	snouted monkey-flower
Mimulus aurantiacus	orange bush monkey-flower
Mimulus brevipes	wide-throated monkey-flower
Mimulus cardinalis	scarlet monkey-flower
Mimulus guttatus	common monkey-flower
Mimulus pilosus	mimenanthe
PLANTAGINACEAE	**PLANTAIN FAMILY**
Collinsia childii	Child's collinsia
Collinsia concolor	southern Chinese houses
Collinsia heterophylla	Chinese houses
Collinsia heterophylla var. *austromontana*	purple Chinese houses
Keckiella cordifolia	heart leaved keckiella
Keckiella ternata	blue stemmed keckiella
Keckiella ternata var. *ternata*	summer bush penstemon
PLATANACEAE	**SYCAMORE FAMILY**
Platanus racemosa	western sycamore
POLEMONIACEAE	**PHLOX FAMILY**
Allophyllum gilioides subsp. *violaceum*	dense false gilia
Allophyllum glutinosum	blue false gilia
Collomia grandiflora	grand collomia
Gilia capitata	blue field gilia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum elongatum var. *elongatum*	long-stemmed buckwheat
Eriogonum fasciculatum var. *fasciculatum*	coastal California buckwheat
Pterostegia drymarioides	California thread-stem
Rumex salicifolius	willow dock
RANUNCULACEAE	**BUTTERCUP FAMILY**
Aquilegia formosa	columbine
Clematis pauciflora	ropevine
Clematis sp.	clematis
Thalictrum fendleri	meadow-rue
RHAMNACEAE	**BUCKTHORN FAMILY**
Ceanothus integerrimus var. *macrothyrsus*	deerbrush

ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
Ceanothus leucodermis	chaparral whitethorn
Frangula californica	California coffeeberry
ROSACEAE	**ROSE FAMILY**
Adenostoma fasciculatum	chamise
Cercocarpus betuloides	birch-leaf mountain-mahogany
Fragaria vesca	California/wood strawberry
Heteromeles arbutifolia	toyon
Potentilla biennis	biennial cinquefoil
Potentilla sp.	cinquefoil
Rubus leucodermis	blackcap raspberry
Rubus parviflorus	thimbleberry
Rubus ursinus	California blackberry
RUBIACEAE	**MADDER FAMILY**
Galium angustifolium	narrow-leaved bedstraw
Galium aparine	goose grass
SALICACEAE	**WILLOW FAMILY**
Salix exigua	narrow-leaved willow
Salix laevigata	red willow
Salix lasiolepis	arroyo willow
SAPINDACEAE	**SOAPBERRY FAMILY**
Acer macrophyllum	big-leaf maple
SAXIFRAGACEAE	**SAXIFRAGE FAMILY**
Boykinia rotundifolia	round-leaved boykinia
Lithophragma affine	woodland star
SCROPHULARIACEAE	**FIGWORT FAMILY**
Scrophularia californica	California figwort
SOLANACEAE	**NIGHTSHADE FAMILY**
Solanum americanum	small-flowered nightshade
Solanum douglasii	Douglas' nightshade
Solanum xanti	chaparral nightshade
STYRACACEAE	**STORAX FAMILY**
Styrax redivivus	snowdrop bush
VIOLACEAE	**VIOLET FAMILY**
Viola pedunculata	Johnny-jump-up
URTICACEAE	**NETTLE FAMILY**
Urtica dioica	stinging nettle
ANGIOSPERMS (MONOCOTS)	
AGAVACEAE	**AGAVE FAMILY**

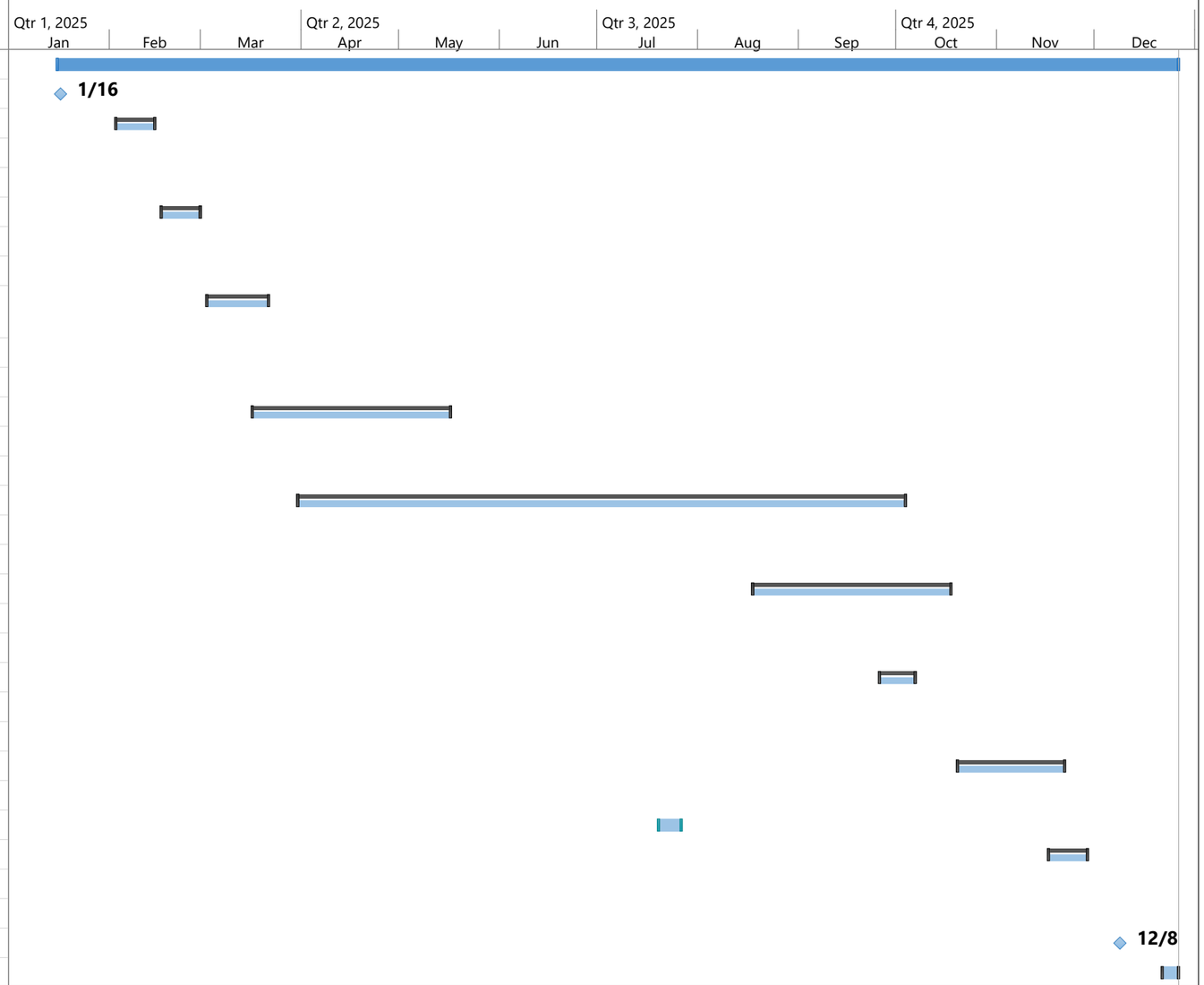
ATTACHMENT 1: NATIVE PLANT SPECIES OBSERVED DURING FOCUSED PLANT SURVEYS

Scientific Name	Common Name
Chlorogalum pomeridianum	soap plant
Hesperoyucca whipplei	our Lord's candle
CYPERACEAE	**SEDGE FAMILY**
Carex deflexa var. *boottii*	mountain mat sedge
Carex leptopoda	many-stem sedge
Carex multicaulis	sedge
Carex praegracilis	clustered field sedge
Cyperus eragrostis	tall cyperus
Cyperus sp.	sedge
Scirpus microcarpus	small-fruited bulrush
JUNCACEAE	**RUSH FAMILY**
Juncus articulatus subsp. *articulatus*	jointed rush
Juncus dubius	mariposa rush
Juncus mexicanus	Mexican rush
Juncus phaeocephalus	brown-headed rush
LILIACEAE	**LILY FAMILY**
Lilium humboldtii subsp. *ocellatum*	Humboldt lily
POACEAE	**GRASS FAMILY**
Elymus triticoides	beardless wild rye
Festuca microstachys	small fescue
Melica imperfecta	coast range melic
Muhlenbergia rigens	deergrass
Poa infirma	weak bluegrass
Stipa coronata	giant needlegrass
THEMIDACEAE	**BRODIAEA FAMILY**
Dichelostemma capitatum subsp. *capitatum*	blue dicks

APPENDIX G

Sequence of Operations

ID	Arrowhead Pipeline Decomissioning	Duration	Start	Finish
1	**Arrowhead Pipeline Decommissioning**	**247 days**	**Thu 1/16/25**	**Fri 12/26/25**
2	**Pre-decommissioning Meeting**	1 day	Thu 1/16/25	Thu 1/16/25
3	**Initial Survey**	**10 days**	**Mon 2/3/25**	**Fri 2/14/25**
4	Crew 6			
5	Flights 60			
6	**Mob/Demob**	**10 days**	**Mon 2/17/25**	**Fri 2/28/25**
7	Crew 30			
8	Flights 400			
9	**Removal of Piping/Electronics and Borehole Pressure Grouting**	**15 days**	**Mon 3/3/25**	**Fri 3/21/25**
10	Crew 30			
11	Flights 600			
12	**Vault Demolition**	**45 days**	**Mon 3/17/25**	**Fri 5/16/25**
13	Crew 30			
14	Flights 1,600			
15	**Disassembly and Removal of Pipeline and Pipe Stands**	**135 days**	**Mon 3/31/25**	**Fri 10/3/25**
16	Crew 30			
17	Flights 4,800			
18	**Recontouring and Regrading**	**45 days**	**Mon 8/18/25**	**Fri 10/17/25**
19	Crew 30			
20	Flights 1,600			
21	**Biodiversity Restoration**	**7 days**	**Fri 9/26/25**	**Mon 10/6/25**
22	Crew 10			
23	Flights 300			
24	**Final Erosion Plan Implementation**	**25 days**	**Mon 10/20/25**	**Fri 11/21/25**
25	Crew 30			
26	Flights 800	7 days	Sun 7/20/25	Sun 7/27/25
27	**Post Decommissioning Survey**	**10 days**	**Mon 11/17/25**	**Fri 11/28/25**
28	Crew 6			
29	Flights 60			
30	**Final Acceptance**	1 day	Mon 12/8/25	Mon 12/8/25
31	**Post-Decommissioning Meeting**	5 days	Mon 12/22/25	Fri 12/26/25



Project: Full Pipeline - Above G
Date: Fri 10/18/24

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	